

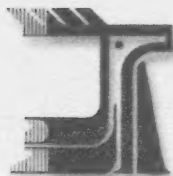
COSEWIC ANNUAL REPORT

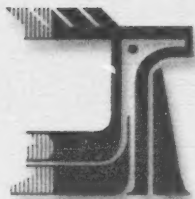
PRESENTED TO
THE MINISTER OF THE ENVIRONMENT
AND
THE CANADIAN ENDANGERED SPECIES CONSERVATION
COUNCIL

FROM

THE COMMITTEE ON THE STATUS OF ENDANGERED
WILDLIFE IN CANADA
(COSEWIC)

August 2005





COSEWIC

(COMMITTEE ON THE
STATUS OF ENDANGERED
WILDLIFE IN CANADA)

COSEPAC

(COMITÉ SUR LA SITUATION
DES ESPÈCES EN PÉRIL
AU CANADA)

Dr. Marco Festa-Bianchet
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Co-chair, COSEWIC Terrestrial Mammals Specialist Subcommittee
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12th August 2005

The Honourable Stéphane Dion
Minister of the Environment
Government of Canada
Ottawa (Ontario)
K1A 0H3

Dear Minister,

You will find enclosed the 2004 -2005 annual report of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), submitted to your attention pursuant to the *Species at Risk Act*. I would like to take this opportunity to thank you for your support of COSEWIC and your work for biodiversity conservation in Canada.

I will start by responding to four elements in your letter of 10th January 2005, sent in the name of the Canadian Endangered Species Conservation Council:

1. 'Appoint members of the new Aboriginal Traditional Knowledge (ATK) Subcommittee and develop procedures for incorporating ATK into the assessment process'

As set out in the annual report, COSEWIC has developed, with representatives of the 5 national aboriginal organizations, a procedure for appointing members of the ATK subcommittee, for

selecting subcommittee co-chairs, and to enable the writing of ATK reports for species chosen by the committee on ATK. With this in mind, COSEWIC has solicited member nominations from these 5 organizations. At the present time, I have had no official word of any nominations sent to either COSEWIC or you. The only two members of the subcommittee are the two current co-chairs. Minister, COSEWIC has been working very hard on this matter, and we are ready to welcome other members and complete the subcommittee, but this will not be possible without candidate nominations. Aside from this, and with the cooperation of the two co-chairs, we are continuing to try and incorporate ATK into our assessments as best we can. The recent status reports on the Peary Caribou and beluga whales are good examples of inclusion of ATK, as it was taken into consideration at the time of the assessments. I should note that ATK is a better enhancement when presented alongside scientific knowledge.

2. 'Considerably develop the incorporation of local knowledge into the assessment process as required by SARA'

As set out in the annual report, COSEWIC undertook three initiatives for incorporating more community knowledge into the assessment process: using interim reports to acquire knowledge, preparing a web questionnaire to give communities the opportunity to contribute to assessments, and forming a working group to develop other methods of acquiring, assessing, and incorporating local knowledge into our assessment process. We have also made efforts to establish contacts with groups that could help us in this task (fishermen, trappers etc.). Finally, several members of COSEWIC, including myself, have made several presentations to schools, universities, and stakeholder groups, to illustrate the COSEWIC assessment process and its role within SARA.

3. 'find ways to rationalize the reassessment process for species at risk given the increasing demands COSEWIC must face every ten years'

Where it is evident that the status has not changed enough to justify a change in assessment, COSEWIC will evaluate the possibility of not producing updated status reports. We will soon be able to take advantage of a system of "live documents" for which we have copyright and which we will be able to use as a starting point for updates. The work of the recovery teams could also help us in producing reports that can be updated and are easier to evaluate. Conversely, we are facing increasing pressures to include more information (including community knowledge) in some status reports, and there has been an increase in the number of unsolicited reports, especially from certain jurisdictions. Unsolicited reports bypass our process of establishing priorities for assessing new species and we have to produce supplementary reassessments every 10 years. I should also stress the endless requests for additional consultations from certain wildlife management boards that then become suddenly silent when we ask them for information during the assessment process.

4. 'organize, if possible, a workshop focussed on assessing the risk of extinction for marine fish species'

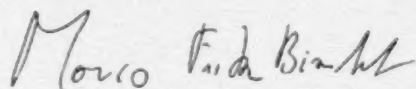
We organized the workshop in Halifax at the beginning of March, and you will find this in the final report. I would like to thank you for the idea since this workshop has had a very positive effect on our capability to assess marine fishes, in identifying the difficulties faced in the past and showing us potential solutions. COSEWIC has received some specific suggestions which it is in the process of evaluating. The workshop and subsequent meetings (most notably a briefing

of selected EC and DFO employees, as well as a meeting with The Honourable Trevor Taylor at St. John's, Newfoundland) allowed us to illustrate the differences between perceptions of COSEWIC operations and our working reality. I was personally very relieved to find that experts participating in this workshop have had very few criticisms so far regarding COSEWIC's assessments of marine fishes. The final Report on the Marine Fish Workshop and recommendations for COSEWIC is included in this annual report and is publicly available.

This report contains the results of species assessments carried out during the November 2004 and May 2005 sessions. As agreed with your predecessor, status reports relevant to these assessments were finalized and translated and are now on the SARA Public Registry. Some of the status reports (Lake Sturgeon, Westslope Cutthroat Trout) could not be finalized in time and will be sent with the next annual report. The assessment results for the latter species have been sent to you for information purposes only and should not trigger the response process pursuant to section 25 of SARA. The report on the Okanagan Population of Chinook Salmon will also be ready for the next annual report.

There are now 3 species from SARA's Schedule 2 left to be reassessed by COSEWIC by June, 2006, namely the Blackfin Cisco, the Great Lakes Deepwater Sculpin and the Lake Erie Watersnake. To ensure that COSEWIC has the time it requires for a thorough reassessment of the status of those 3 species, I am taking this opportunity to request an extension for one more year (until June 2007).

Yours Sincerely,

A handwritten signature in dark ink, reading "Marco Festa-Bianchet". The signature is fluid and cursive, with the first name "Marco" being the most prominent.

Marco Festa-Bianchet
Chair of COSEWIC

ITEM I - COSEWIC ACTIVITIES

1. SPECIES ASSESSMENT MEETING – FALL 2004

Date: November 23-25, 2004

Location: Ottawa, Ontario

Attendance

Members - 38 members/alternates

Secretariat Staff - 8

Observers - 14 (1 from WWF-Canada, 1 from Nature Canada, 3 students McGill University, 5 from the Canadian Wildlife Service, 1 from Parks Canada, 1 from Nature Serve Canada, 2 co-chairs elect).

Regrets - 2 members/alternates (Prince Edward Island, Saskatchewan, Yukon)

At the meeting of COSEWIC (Committee on the Status of Endangered Wildlife in Canada) the committee members reviewed the conservation status of 20 wildlife species.

OTHER BUSINESS ITEMS OF IMPORTANCE:

Emergency Assessment requests:

At that November 2004 meeting, the Chair advised members that, in May 2004, a request for emergency assessment for the Georgina Depression Marbled Murrelet was received. The range jurisdictional members, the co-chairs of the Birds SSC and outside experts all agreed that this population was not a designatable unit and therefore no assessment was made. A response to this effect was provided by the Chair to the requester.

In addition, a new request for emergency assessment of the Sakinaw Lake population of Sockeye Salmon was received in November 2004. This request was discussed by COSEWIC and it was agreed that COSEWIC had already done its assessment and recommendation with respect to this population. A response to this effect was provided by the Chair to the requester.

Continuing Observer Status:

COSEWIC agreed to extend continuing observer status for the World Wildlife Fund Canada, Canadian Wildlife Federation and Nature Canada for a further period of four (4) years effective May 2005.

Teleconference:

As done in past years, COSEWIC held a teleconference at the end of its meeting with the Canadian Wildlife Directors and another one with the Wildlife Management Boards to inform all jurisdictions about the assessment results.

Operations and Procedure Manual (O&P Manual):

At its November 2004, Assessment Meeting, COSEWIC agreed to work toward having its O&P Manual published in the next year.

2. SPECIES ASSESSMENT MEETING – SPRING 2005

Date: May 2-6, 2005

Location: St. Pauls Inlet, Newfoundland and Labrador

Attendance

Members - 43 members/alternates

Secretariat Staff – 7

Observers – 14 (6 from the Department of Environment and Conservation, Government of Newfoundland and Labrador, 1 from Canadian Wildlife Federation, 1 from Parks Canada, 2 from Canadian Wildlife Service, 1 from Guelph University, 1 from Nature Serve Yukon, 1 from the BC Conservation Data Centre, 1 from the B.C. Ministry of Water, Land and Air Protection)

Regrets – 1 member/alternate (Government of Yukon Territory)

Committee members reviewed the conservation status of 43 wildlife species, including the Emergency Assessment of the Chinook salmon, Okanagan population.

Teleconference:

As done in past years, at the end of each assessment meeting, COSEWIC held a teleconference with the Canadian Wildlife Directors and one with the Wildlife Management Boards to inform all jurisdictions about the assessments.

COSEWIC Non-government members:

COSEWIC decided to rename "non-government members" as "members at large" in all his communications.

OTHER BUSINESS ITEMS OF IMPORTANCE:

Emergency Assessment requests:

Northern Goshawk, *laingi* subspecies, Haida Gwaii population, *Acipiter gentilis laingi*

During the May 2005 meeting, the Chair informed all members that, on April 26, 2005, a request for emergency assessment for the Northern Goshawk, *laingi* subspecies, Haida Gwaii population, was received from John Brodhead, Gowgaia Institute. The Chair of COSEWIC, range jurisdictional members, the co-chairs of the Birds SSC and other members with ornithological and genetic expertise met and discussed the request on May 1, 2005. Following this consultation, it was decided that the Chair of COSEWIC would write back to the applicant of this request, indicating that more information on the immediacy of the threat and about the distinctiveness of this population would be needed for COSEWIC to decide if an emergency assessment is warranted. A letter to this effect was sent on May 10 by the Chair to the applicant.

Chinook Salmon, *Oncorhynchus tshawytscha* (Okanagan population)

On March 26, 2005 the Committee on the Status of Endangered Wildlife in Canada received a request for an Emergency Assessment of the Okanagan Population of Chinook Salmon from Mr. Howie Wright on behalf of the Okanagan Nation Alliance Fisheries Department. An emergency Assessment subcommittee was established and Minister Dion was informed. The Emergency Assessment Subcommittee held two teleconferences, evaluated the available evidence and contacted appropriate people to obtain further information, which was received from several sources. The Emergency Assessment Subcommittee agreed to refer all the available documentation to COSEWIC in plenary.

On May 4, 2005, the full Committee examined the documentation provided and assessed that the available evidence clearly indicates that the conservation status of the Okanagan population of Chinook salmon warrants an Emergency Listing under Section 29(1) of SARA. Consequently, COSEWIC passed the following motion: "The Okanagan Chinook salmon is facing an imminent threat to its survival, such that an Emergency Listing of the Species as Endangered is warranted". COSEWIC informed Minister Dion and other appropriate jurisdictions of the results of the emergency assessment and publicly announced it in a press release on May 6. The Chair of COSEWIC also informed the applicant of the result of the request for an emergency assessment along with the reasons.

Marine Fishes Workshop (Halifax, NS, March 2-4, 2005)

As requested by the Minister of the Environment, COSEWIC, jointly with the Department of Fisheries and Oceans (DFO), Environment Canada (EC) and the Newfoundland and Labrador Department of Fisheries and Aquaculture, held a workshop to address concerns about the process that COSEWIC uses for assessing probability of extinction in marine species.

- That workshop took place in Halifax, Nova Scotia, Canada on 2-4 March 2005. It involved a variety of international experts on marine species and the use of quantitative criteria for assessing the conservation status of species, including representation from COSEWIC, DFO, EC, the Newfoundland and Labrador Department of Fisheries and Aquaculture, industry representatives, non-government organizations, IUCN and other international experts. The workshop participants provided their expert observations and made recommendations for consideration by COSEWIC.

The Report on the Marine Fish Workshop and Recommendations for COSEWIC is included as **Appendix I** of this annual report

3. SUMMARY OF SPECIES ASSESSMENT MEETING

COSEWIC met in November 2004 and in May 2005 to assess or reassess the status of 63 wildlife species (species, subspecies and populations). COSEWIC also made an

Emergency Assessment on May 4, 2005. The species assessment results include the following:

Extinct: Lake Ontario Kiyi

Extirpated: Striped Bass, St. Lawrence Estuary population

Endangered: North Pacific Right Whale, Copper Redhorse, American Chestnut, Rusty Cord-moss, Williamson's Sapsucker, Blanding's Turtle, Nova Scotia population, Shortnose Cisco, Winter Skate, Southern Gulf population, Ottoe Skipper, White Flower Moth, Branched Phacelia, Dense Spike-primrose, Dense-flowered Lupine, Grand Coulee Owl-clover, Spalding's Campion, White Meconella, Chinook Salmon, Okanagan population (submitted separately as an Emergency Assessment)

Threatened: Striped Bass, Southern Gulf of St. Lawrence population, Striped Bass, Bay of Fundy population, Eastern Yellow-bellied Racer, Dwarf Lake Iris, Hill's Thistle, Macoun's Meadowfoam, Showy Phlox, Alkaline Wing-nerved Moss, Bowhead Whale, Hudson Bay-Foxe Basin population and Davis Strait-Baffin Bay population, Fin Whale, Pacific population, Blanding's Turtle, Great Lakes population, "Eastslope" Sculpin, St. Mary and Milk River populations, Black redhorse, Spotted Gar, Winter Skate, Eastern Scotian Shelf population, Verna's Flower Moth, Baikal Sedge, Cliff Paintbrush, False Rue-anemone, Mountain Holly Fern.

Special Concern: Narwhal, Green Sturgeon, Bering Cisco, Western Yellow-bellied Racer, Red-legged Frog, Ancient Murrelet, Swamp Rose-mallow, Bowhead Whale, Bering-Chukchi-Beaufort population, Fin Whale, Atlantic population, Grass Pickerel, Shortnose Sturgeon, Spotter Sucker, Upper Great lakes Kiyi, Warmouth, Winter Skate, Georges bank-Bay of Fundy population, Hill's Pondweed, Houghton's Goldenrod, Prototype Quillwort, Banded Cord-moss, Pigmy Pocket, Frosted Glass-whiskers, Nova Scotia population Moss

As of May 2005, the COSEWIC assessment results includes 465 species in various categories, including 184 endangered species, 129 threatened species and 152 species of special concern. In addition, 22 species are extirpated (no longer existing in the wild in Canada) and 13 are extinct.

IMPORTANT TO NOTE:

- a) At its May 2005 Assessment Meeting, COSEWIC assessed the status of Lake Sturgeon, Western populations as Endangered, Lake Sturgeon, Southern Hudson Bay and James Bay populations as of Special Concern, Lake Sturgeon, Great Lakes and Western St. Lawrence River populations as of Special Concern, and Lake Sturgeon, Rainy River -Lake of the Woods populations, as of Special Concern.

At the same meeting, COSEWIC assessed the Westslope Cutthroat Trout, Alberta population, as threatened and the Westslope Cutthroat Trout, British Columbia population, as special concern.

Even if COSEWIC has assessed the Lake Sturgeon (*Acipenser fulvescens*) and the Westslope Cutthroat Trout (*Oncorhynchus clarkii lewesi*), the status reports for these two species will only be finalized in May 2006. For this reason,

COSEWIC is not submitting those status assessments for consideration for listing under SARA at this time.

- b) There are now 3 species from SARA's Schedule 2 left to be reassessed by COSEWIC by June, 2006, namely the Blackfin Cisco, *Coregonus nigripinnis*, Deepwater Sculpin Great Lakes Population, *Myoxocephalus thompsoni* and Lake Erie Watersnake, *Nerodia sipedon insularum*. To ensure that COSEWIC has the time it requires for a thorough reassessment of the status of those 3 species, an extension order for one more year (until June 2007) is requested.

See Appendix II for the COSEWIC Press Releases from the November 2004 and May 2005 Assessment meetings.

4. ANNUAL SPECIES SPECIALIST SUBCOMMITTEES MEETINGS

Aboriginal Traditional Knowledge Subcommittee (ATK SC)

July 15, 2004

Ottawa

Membership: currently the subcommittee is composed only of its two (2) co-chairs as efforts to solicit nominations from several National Aboriginal Organizations are still underway.

Summary of key discussion items: The ATK Subcommittee co-chairs met with the technical representatives of the National Aboriginal Organizations and Marco Festa-Bianchet on July 15, 2004, in Ottawa, to develop criteria for ATK SC membership eligibility and an agreed process for member selection.

One of the ATK SC co-chair attended also two NACOSAR (National Aboriginal Council on Species at risk) development meetings in 2005 in Ottawa (January and February) and agreed to liaise/advise NACOSAR on ATK SC matters. Progress on establishing the full membership of the ATK SC is dependent on the establishment of NACOSAR itself.

Amphibians & Reptiles Specialist Subcommittee

October 8, 2004

Best Western Ville-Marie, Montreal

Members: 6 including 2 co-chairs

Secretariat: 1

Observers: several from McGill University

Regrets: Don Rivard, Steve Hecnar, Pat Gregory

Summary of key discussion items: ongoing reports in preparation for assessments were reviewed as well as candidate species.

Other discussion items included the mapping problems and a plan to have a symposium on mapping and perhaps phylogeography. There was discussion about publishing a

book on the amphibian and reptile COSEWIC reports. Various other announcements and SSC concerns were addressed and presented.

Arthropods Specialist Subcommittee

September 30-October 2, 2004

Embassy West Hotel, Ottawa

Members: 13 including the co-chair

Secretariat: 1

Observers: 1(Dr. Robert Anderson of the Canadian Museum of Nature attended on October 1st.)

Summary of key discussion items: availability of SSC annual meeting minutes/ drafted notes through access to information; process for unsolicited status reports; terms of reference for the ATK subcommittee; approval of Arthropods Subcommittee membership; concerns having one (1) SSC handling the immense variety contained within the arthropods (members reiterated the need for a future split along aquatic/terrestrial lines); recognition of need for field work; wording for the next call for membership; non-lepidopteran expertise within the current SSC membership; status reports in progress; newly commissioned status reports; new method of prioritizing species for the call for bids; whether early update for some species should be requested; priority lepidopteran species for the next call for bids and justifications; and some suggested non-lepidopteran arthropods that may need consideration by the SSC. Six of the reports in progress were discussed and status recommendations were made for these species. There were further discussions and changes to the prioritization scheme for butterflies. The next SSC meeting is planned for Fredericton, NB.

Birds Specialist Subcommittee

August 22-23, 2004

Laval University, St-Foy, Quebec

Members: 9 including 2 co-chairs

Secretariat: 2

Observers: Marcel Gahbauer from McGill University and Marylène Boulet from Université Laval.

Summary of key discussion items: An application for emergency assessment for the Marbled Murrelet, Georgia Depression population was discussed with the SSC membership; among the SSC and a number of other seabird experts consulted, there was a consensus that this was not a Designatable Unit under COSEWIC's definition. COSEWIC sent a reply to the requester, explaining why the application could not be received. SSC also discussed Status reports in preparation at length including a drafted unsolicited report on the Ivory Gull submitted by the Canadian Wildlife Service. SSC members were updated on new status assessment procedures under SARA, particularly procedures for unsolicited reports and candidate species prioritization. The Secretariat reported on the ATK process in COSEWIC. A SSC member gave a presentation on the use (and misuse) of survey data in species assessment. A few species of concern were discussed in details for inclusion on the candidate list. There was also a long discussion of the candidate species list and prioritization methods.

Freshwater Fishes Specialist Subcommittee

September 11-13, 2004

Delta Winnipeg Hotel, Winnipeg, Manitoba

Members: 10 including 2 co-chairs

Secretariat: 1

Observers: 3

Summary of key discussion items: Eleven status reports were reviewed and technical summaries with SSC recommendations were prepared for species being assessed by COSEWIC in November 2004. The SSC priority list was reviewed and possible species for the next call for bids considered as well as a special project for the delineation of DUs for lake whitefish (*Coregonus clupeaformis*). The next meeting is planned for the fall of 2005 in St. John's, NL.

Marine Fishes Specialist Subcommittee

September 11-13, 2004

Delta Winnipeg Hotel, Winnipeg, Manitoba

Members: 12 including 1 co-chair

Secretariat: 1

Invited participants from COSEWIC: Lara Cooper (DFO), David Coffin (NL), Marco Festa-Bianchet (Chair)

Observers: Sandy Argue (BC Ministry of Agriculture), Michelle Herzog (University of Toronto), Patrick McGuinness and Rob Morley (Fisheries Council of Canada)

Summary of key discussion items:

A great deal of progress was made at this meeting. The best methods for addressing population trends in marine fishes were discussed and plans were made for a more consistent methodology. A draft Operations and Procedures Manual for Marine Fishes was discussed. The Candidate List was revised. New procedures for prioritizing, including the use of RAMAS Red List software, were discussed and two working groups (Atlantic and Pacific) were struck to complete the 2004-2005 prioritization. Progress was made in the development of Designatable Units for salmon. Progress was also made in the development of Marine Ecozones for listing purposes. Three reports were evaluated and a status recommended for COSEWIC. It was decided that four reports on Atlantic fish species would be retracted from the November 2004 COSEWIC meeting. Another report, the status report on the American Shad, is still at the draft report stage and the SSC has decided to put this report on hold until more information from ongoing studies becomes available.

Marine Mammals Specialist Subcommittee

October 9-10, 2004

Vancouver Aquarium, Vancouver, B.C.

Members: 10 including 2 co-chairs

COSEWIC Secretariat: 1

Observer: 0

Summary of key discussion items: Reviewed and discussed designations made for harbour porpoise (Pacific population), Steller sea lions, and beluga whales by COSEWIC at its November 2003 and May 2004 meetings. The subcommittee also received an update on SARA and COSEWIC procedures from the Secretariat.

Status reports in preparation were discussed by the SSC members. A progress report was given for a pending report on Atlantic harbour seals.

Prioritized species of marine mammals that were identified as requiring status reviews included the sea otter, Cuvier's beaked whale, bearded seal, and all *Mesoplodon* beaked whale species.

One teleconference was held on October 19, 2004, to discuss information needed to assess the walrus. Participants included SSC members and invited guests.

Molluscs Specialist Subcommittee

September 24-25, 2004

University of Calgary, Calgary, AB

Members: 6 including 2 co-chairs

Secretariat: 1

Observers: none

Regrets: Derek Davis, Mark Hanson, Glen Jamieson

Summary of key discussion items: The subcommittee spent considerable time reviewing the new prioritization scheme and reviewing the species on the Mollusc candidate list. Several species were removed and others were moved up the list. Seven species were recommended for assessment by COSEWIC. SSC discussions included the need to update the list of landsnails in Quebec and Ontario and the difficulty to find a qualified person to do it. This is to be used for the Molluscs Candidate List as part of the work carried by the SSC. The SSC is planning to meet in Burlington, ON in 2005.

Plants & Lichens Specialist Subcommittee

October 15-16, 2004

Pallisades Maclab Hotel & Resorts, Jasper, Alberta

Members: 18 including 2 co-chairs

Secretariat : 2

Observers : 0

Summary of key discussion items:

Vascular plants. The vascular plants specialists revised and updated the candidate list of 358 plants.

For the Mosses and lichens, a contract has been let to update two databases on rare mosses of Canada that will allow the SSC to prepare a prioritized candidate list for mosses in Canada. Completion of the work is anticipated for the fall of 2005. A work description for a similar contract for the lichens has been prepared and a call for bids for the project is planned.

A request for the possible preparation of a status report on Seneca snakeroot (*Polygala senega*) was submitted by Saskatchewan Environment Resource Management due to the substantial collection of wild plants for the herbal trade that has been on-going in both Saskatchewan and Manitoba. The request was discussed and the decision taken not to propose this species for a national assessment. The species is widespread in eastern Canada and there is no biological or geographical basis for the distinction of the Saskatchewan and Manitoba populations as geographically distinct

populations that would warrant recognition and assessment by COSEWIC. An answer to that matter was sent to the requester.

A total of 19 vascular plants status reports for COSEWIC assessment in November 2004 and May 2005 were reviewed and recommendations presented.

Next Annual Subcommittee Meeting

The next meeting is proposed for Fundy National Park, September 24-25, 2005.

Terrestrial Mammals Specialist Subcommittee

October 1, 2004

Acadia University, Wolfville, N.S.

Members: 7 including 2 co-chairs

Secretariat: 1

Observers: 10

Regrets: Dr. Judith L. Eger

Summary of key discussion items: The SSC reviewed the recent assessments by COSEWIC of five terrestrial mammals; discussed progress on status reports in preparation for five other species; decided for which species an update report should be commissioned in 2005 and 2006. The SSC is proposing to hold a teleconference in 2005 rather than a meeting. A request to assess the status of albino moose in a region of Ontario was unanimously rejected because these animals are not a distinct population. An answer to that matter was sent to the requester.

ITEM II –PREPARATION FOR THE ELECTION OF CHAIR OF COSEWIC

Following procedures set out in its Operations and Procedures Manual, a nomination Committee was struck in May 2005 in preparation for the election of a new Chair in May 2006, at which time Marco Festa-Bianchet will finish his second term as Chair of COSEWIC. René Belland (current co-chair, COSEWIC Vascular Plants and Lichens Specialist Subcommittee) will chair the Selection Committee.

ITEM III - COSEWIC MEMBERSHIP

Membership Changes

For Information:

See Appendix III for a list of current and proposed members.

For Approval:

a) Members from jurisdictions (Provincial/Territorial/Federal)

At the Spring 2005 meeting of COSEWIC, the chair reminded again members from jurisdictions that CESSC members have to notify the Chair of COSEWIC by the end of June 2005 of the name of any new member or alternate to be submitted to the Minister of the Environment for appointment after consulting with the CESSC. A curriculum vitae for each nominee must be on record with the COSEWIC Secretariat.

Since July 2004, one jurisdiction, British Columbia, has submitted a new name for an alternate member on COSEWIC: Susan Pollard (M.E.C.)

b) Co-chairs of Species Specialist Subcommittees

New /Renewed members were selected as a result of a process started with a January 2005 public call for members. For Marine Fishes, both co-chair positions were advertised since one co-chair resigned in December 2004 and the other co-chair's term expires December 31, 2005. Justifications and biosketches are herein provided for the following nominees submitted for consideration and review by CESSC and subsequent appointment by the Minister of the Environment effective January 1, 2006:

Co-chair, Plants & Lichens Specialist Subcommittee –Dr. Erich Haber
Co-chair, Freshwater Fishes Specialist Subcommittee – Dr. Robert Campbell
Co-chair, Terrestrial Mammals Specialist Subcommittee – Dr. Mark Bringham
Co-chair, Marine Fishes Specialist Subcommittee – Dr. Howard Powles
Co-chair, Marine Fishes Specialist Subcommittee- Dr. Paul Bentzen *

* - All memberships are for a four year term with the exception of Dr. Bentzen who was recommended for two years to finish the term of the Marine Fishes co-chair who resigned, and to ensure that in future, both co-chairs' positions are not vacated at the same time.

See Appendix IV (Biosketches of new/renewed COSEWIC members).

ITEM IV - COSEWIC OPERATIONS AND PROCEDURES

COSEWIC approach to streamlining reassessment:

As a first step toward developing an approach to deal with reassessment, commissioned COSEWIC status reports after May 2001 are "living documents": after the status report is concluded, any subsequent update reports will be prepared simply by adding new information to the existing report and, where appropriate, updating factual information. COSEWIC is cited as the author on the report's cover page (ownership and copyright rest with the Crown).

One of the options for consideration at this time is to contact authors of COSEWIC status Reports produced before May 2001 to ask if they would give to the Crown the ownership and copyright of the report(s) they authored. Furthermore, the *Species at risk Act* (SARA) offers some flexibility concerning species reassessment, as SARA refers to the review of the classification of each species at least once every ten years, without requiring specifically that COSEWIC must reassess each species.

At its May 2005 assessment meeting, COSEWIC struck a working group to develop options to streamline the reassessment process, for consideration by COSEWIC in a near future.

Community Knowledge into COSEWIC Assessment Process:

COSEWIC has established a Working Group (WG) charged to define what constitutes Community Knowledge for the purpose of the COSEWIC species assessment process and to identify means for accessing, gathering, validating and incorporating this knowledge in the assessment process. A drafted framework on how to incorporate community knowledge in the COSEWIC assessment process, was presented at the COSEWIC May 2005 meeting for members review and input, along with a draft Website model and questionnaire to be used as a tool to provide to communities to inform COSEWIC of knowledge that they may have and could be useful for Status assessment.

As a first step, COSEWIC has agreed to use the website as contact point to receive input for species status reports in preparation and to distribute the Interim report to individuals and organizations expected to be able to provide community knowledge. Procedures to develop the questionnaire and to provide the Interim report to holders of community knowledge are to be developed in time for the 2006 COSEWIC meeting in Saskatchewan. During the next year, COSEWIC will continue its work toward developing options on how to incorporate community knowledge into COSEWIC Assessment process.

Report on the Marine Fish Workshop and Recommendations for COSEWIC: This was discussed by COSEWIC at the May 2005 meeting and COSEWIC has agreed:

- to have the Chair as an "editor in chief" to ensure that all important comments and information have been considered in final reports.
- to establish within COSEWIC a working group to consider other assessment criteria used to assess marine fish, based on the work done by FAO (Food and Agriculture Organization of the United Nations), CITES (Convention on International Trade in Endangered Species of Fauna and Flora) and NMFS (National Marine Fisheries Service).

COSEWIC Assessment Process and Criteria:

At its May 2005 meeting, COSEWIC agreed to establish a permanent Working Group on criteria within its Operations and Procedures Subcommittee to ensure that COSEWIC continues its tradition of quality and rigor in its assessment process. This permanent Working Group will receive and review the feedback in the near future from other COSEWIC members who have been tasked to consider other assessment criteria used for marine fish. (see above)

Emergency Assessment Process:

In May 2005, COSEWIC approved a slight change to its O&P Manual to clarify that, at the discretion of the Chair, COSEWIC members other than SSC Co-chairs and members from Range Jurisdictions may be added to the Emergency Assessment Subcommittee (EAS).

Species Prioritization Process:

COSEWIC modified its procedures to better reflect the process adopted at its May 2005 meeting. The choice of species for the commissioning of new status reports is based on the ranking of selected species from the Candidate List according to their perceived level of risk.

SSCs first select species from their respective Candidate List (available from the COSEWIC website), and for each species, submit a supporting paragraph structured around the prioritization criteria given in Appendix E1, Part 2 of the COSEWIC O&P Manual. The Secretariat compiles the submissions with supporting paragraphs, which are then distributed to all COSEWIC members at least two months before a Species Assessment Meeting. Jurisdictional and non-government members review the supporting paragraphs to verify information. All members of COSEWIC rank the proposed species from highest to lowest, using guidelines shown in Appendix E1, Part 2 of the COSEWIC O&P Manual. Members submit their ranks to the Secretariat, which then generates a ranked list based on the median rank for each species. The Secretariat distributes the ranked list, together with the list of required updates to all COSEWIC members one month before the Species Assessment Meeting.

Summary – Documents Recommended for Approval

Appendix V: Guidelines For Recognizing Designatable Units Below the Species Level (COSEWIC O&P Manual –Appendix F5)

Appendix VI: COSEWIC Assessment Process, Categories and Guidelines (COSEWIC O&P Manual –Appendix E3)

Appendix VII: Applications for Species Assessment and Unsolicited Reports (COSEWIC O&P Manual –Appendix F9)

ITEM V – SPECIES STATUS ASSIGNMENTS

List of Species assessed since the last reporting indicating status assigned, reasons (including uncertainties where applicable and COSEWIC Criteria (with alphanumeric codes).

See Appendix VIII

The status reports are available on the Public Registry - www.sararegistry.gc.ca - in English and French.

ITEM VI - WILDLIFE SPECIES ASSESSED BY COSEWIC SINCE ITS INCEPTION

See Appendix IX:

May 2005 Canadian Species at Risk. This publication is available on the Public Registry and includes all wildlife species assessed by COSEWIC since its inception.

APPENDIX I

Report on the Marine Fish Workshop and Recommendations for COSEWIC

Halifax, Nova Scotia, 2-4 March 2005

Executive Summary

The purpose: The mandate of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is to assess the status of species that are considered to be at risk of extinction in Canada. This workshop addressed concerns about how COSEWIC assesses the probability of extinction in marine fishes. The workshop participants provided their expert observations and recommendations for consideration by COSEWIC.

The theory:

The COSEWIC definition for extinction seems appropriate. Some participants, however, questioned whether "extinction" should be used to refer to the disappearance of the last individual of a species, or the point at which numbers are so low that the species no longer plays an ecological role in its environment.

There are many examples of local extinctions of marine fish, although there are few examples of species-level extinctions. Marine fish are as vulnerable to extinction as other taxa at similar population levels and with similar life-history traits. Loss of populations is the first step towards global extinction. Even if there are millions of individuals left after a significant decline, they may still be at risk. The number of individuals remaining after significant population decline may not be as important as other life-history factors that affect the viability of the remaining population.

There was consensus that major ecosystem shifts have occurred following severe stock depletion. Examples were provided.

The data:

It is important to include all available information in status reports and in assessments, recognizing the strengths and weaknesses of each type of information. For marine fish, data such as catch per unit effort for trends in abundance, age structure, age at maturity, sex ratios, and reconstructed biomass estimates from these metrics are useful. Other examples were provided. Special consideration should be given to species with particular habitat requirements.

There needs to be a cooperative approach during the preparation and review of species status reports; both COSEWIC and the jurisdictions involved can improve in key areas.

- Continue to ensure that jurisdictional data (inventories and analysis) are obtained and incorporated into status reports before COSEWIC assessment and SARA listing.
- There was consensus that jurisdictions need to pay earlier attention to the candidate lists so that key information can be collected to support assessments and reduce uncertainty.

The scientific community should be consulted as widely as possible (e.g., including fisheries assessment scientists outside of the Department of Fisheries and Oceans).

Community knowledge is a potentially important source of information. COSEWIC should investigate ways to access reliable community knowledge throughout its process.

The assessment process:

COSEWIC's process of assessing a species against quantitative criteria (including a decline criterion), and then considering other available information (such as age and size at maturity, vulnerability to fishing and Allee effect/inverse density dependence) is appropriate. Specific suggestions for enhancing these guidelines were provided.

COSEWIC should consider the work done by FAO, CITES, and NMFS on assessment criteria as part of its ongoing work to improve its assessment process. In particular, COSEWIC could consider the 'modifying factors' proposed by these groups, such as the role of extent of decline vs. rate of decline and the role of absolute population size relative to population decline. There was a difference of opinion regarding whether extent of decline (decline from a normal historic baseline) should be a modifying factor for the existing decline criterion (criterion A), a replacement for it, or an additional criterion.

Better communication by COSEWIC:

The meaning of the term "risk of extinction" must be clarified. Risk refers to the probability of extinction. COSEWIC needs to better communicate what it means by "imminent" and "extinction" to ensure that all members of COSEWIC and the public understand what each assessment means.

It is important to provide better information on how COSEWIC operates, how it does its assessments and on the outcome of deliberations.

All sources of information considered and all sources of uncertainty in the assessment should be clearly presented in the status report. It would be very helpful if COSEWIC explained why certain criticisms and/or information obtained during the review process were not accepted as central to the status report and/or assessment.

Fisheries management vs. conservation:

There is a need to clarify the relationships between reference points used in fisheries management and criteria used by COSEWIC.

1. Introduction

1.1. About COSEWIC

The mandate of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is to assess the status of species that are considered to be at risk of extinction in Canada. The COSEWIC assessment process begins with the selection and prioritization of species requiring assessment, leading to the Prioritized Candidate list; continues with the compilation of available knowledge into the COSEWIC status report;

and ends with the assessment of a species' chance of extinction or extirpation and the COSEWIC status designation.

COSEWIC categorizes each species into one of six status categories: extinct, extirpated, endangered, threatened, special concern, or not at risk. COSEWIC uses quantitative criteria as a tool for assessing the probability that a species may become extinct. After application of the criteria, COSEWIC also considers rescue effect (immigration of individuals from other populations), significant life-history characteristics not addressed by the criteria (such as age at maturity, dispersal characteristics, longevity), threats, and consistency with its definitions of the status categories. The assessment process used at the time of the workshop is available at: http://www.cosewic.gc.ca/pdf/assess_proc_e.pdf

COSEWIC was designated as an advisory body under the Species at Risk Act (SARA). In this role, COSEWIC provides the results of its assessments to government to consider for legal listing. Legal listing of a species as extirpated, endangered or threatened leads to automatic prohibitions on killing or harming of a species, and to the preparation of recovery plans and action plans, or management plans. Although the government's decision of whether to legally list a species also takes into account potential economic and social implications of legal listing, COSEWIC's assessments, based solely on available knowledge, carry substantial weight.

1.2. The purpose and format of the workshop

There has been concern that the methods that COSEWIC uses to classify species according to probability of extinction do not work well for marine species. In particular, there appears to be disagreement over the suitability of the quantitative criteria for evaluating the probability of extinction in marine fishes (or other species with similar life-history traits).

Canada's Minister of the Environment asked COSEWIC to hold a workshop to address concerns about the process that COSEWIC uses for assessing probability of extinction in marine species. That workshop was held in Halifax, Nova Scotia, Canada on 2-4 March 2005. It involved a variety of international experts on marine species and the use of quantitative criteria, including representation from COSEWIC, the Department of Fisheries and Oceans (DFO), the Government of Newfoundland and Labrador, industry representatives, non-government organizations, IUCN and other international experts (see Appendix 1).

The workshop began with a set of presentations on various topics of particular relevance to those assessing probability of extinction in marine species. The participants then formed four breakout groups, each tasked with a set of questions. Discussions within the breakout groups, and during plenary sessions, allowed the groups to refine their recommendations and comments for COSEWIC.

This report details the discussion topics and results of the workshop, with specific recommendations from the participants: a) to assist COSEWIC in its assessment process and to improve upon the data used to assess marine fish species; b) to improve

the means by which COSEWIC communicates its objectives and results; and c) to identify topics for further consideration by COSEWIC.

2. Presentations

Eleven presentations on the first day of the workshop informed the participants of various perspectives regarding the assessment of marine species, provided history and context for using quantitative criteria in assessing species (by COSEWIC and other organizations such as IUCN and CITES) and investigated some of the diversity within marine species with respect to probability of extinction. This allowed the participants to establish a common terminology and basis for subsequent discussions in breakout groups and during the plenary sessions.

Abstracts for each of the presentations are provided in Appendix 2.

3. Discussion Topics and Recommendations

The intention of the workshop was not to achieve consensus on all the topics discussed. Rather, each working group was tasked to identify areas of uncertainty, note consensus or disagreements and, when possible, provide recommendations to COSEWIC for consideration.

3.1 Which data are useful to assess the probability of extinction in marine fish?

Issue: While there are many different types of data available for assessing the chance of extinction in marine fish, not all may be equally useful.

Questions: What data are available to assess extinction probability in marine fish (e.g., scientific surveys, catch statistics, morphometric data, and age ratios)? What is the minimum time series required for estimating probability of extinction? What are important sources of uncertainty? What are the strengths, weaknesses and relative values of different sources of information?

Data to use in assessing extinction probability of marine fish:

It is important include all available information (including DFO or industry or other stock assessments).

Recognize strengths and weaknesses of different types of information (not all data provide equally appropriate metrics of distribution and abundance):

- Both fisheries-dependent and fisheries-independent data have to be considered. Fisheries-dependent data generally are nonlinear indicators of decline in targeted species but can, in some cases, provide useful metrics of abundance for non-targeted species; fisheries-independent data (scientific surveys) generally are the most useful metrics of abundance and distribution, although their limitations and potential biases (e.g., coverage, catchability) need to be recognized.
- Context is needed for interpreting fisheries-dependent data (what variables

may drive the trends, changes in fish abundance, changes in gear, effort, market price etc.). All available data (including both fisheries-dependent and fisheries-independent data) should be presented in COSEWIC status reports with a discussion (if required) of their relative merit.

Specific types of data that are most useful for assessment of temporal changes in abundance, distribution, and population status include: catch per unit effort (CPUE) for trends in abundance, age structure, age at maturity, sex ratios, and reconstructed biomass estimates resulting from these metrics. However, in most cases, CPUE from directed fisheries is well known to be non-linearly related to actual abundance of the target species. This nonlinearity occurs in such a way as to underestimate the amount of decline in actual abundance.

Community knowledge is a potentially important source of information. COSEWIC must improve its communication with the fishing industry early in the assessment process and seek useful information that the industry may provide.

The scientific community should be consulted widely as possible, including fisheries assessment scientists outside of DFO.

Assessment of probability of extinction should give special consideration to species with special habitat requirements, especially:

- Anadromous species;
- Species that are estuarine-dependent; and
- Species whose marine habitats are potentially vulnerable to physical disturbance, especially habitats essential for critical life-history stages.

Documenting sources of data and uncertainties

All sources of information considered should be clearly presented in the status report. It would be very helpful if COSEWIC explained why certain criticisms and/or information obtained during the review process were not accepted as central to the status report and/or assessment.

Identify all sources of uncertainty (e.g., differences in coverage of surveys and the range of the species, type of habitat, as well as the timing of the survey).

3.2 Should we apply the decline criterion to marine fish whose populations still number in the millions?

Issue: Of the five quantitative criteria used by COSEWIC, the decline criterion (http://www.cosewic.gc.ca/pdf/assess_proc_e.pdf, Table 2, Criterion A) is most commonly applied to marine fish. This criterion has been criticized as being inappropriate for commercially exploited marine fish because the threshold values in the COSEWIC guidelines are thought by some to result in placement in a status category when the probability of extinction is not sufficient to warrant concern. Another contentious issue concerns the appropriate means of estimating decline and the time period over which the decline is quantified.

Questions: What is the justification for using a 50 or 70% population decline as a reference point? How should the distribution and the dispersion of the remaining fish be considered in assessments? What reference points should be used when estimating decline, e.g., decline in relation to what past level of abundance? Over what period of time should the decline be quantified?

The assessment process

As part of COSEWIC's ongoing work to improve its assessment process, the work done by FAO, CITES and NMFS on assessment criteria should be considered further (e.g., FAO 2001; Mace et al. 2002).

A decline criterion has a legitimate role in assessing probability of extinction. In COSEWIC's process, it functions as a starting point for discussion about the status of the species, and that discussion includes consideration of all other available information. This is an appropriate use of all the criteria, including the decline criterion.

Modifying factors

COSEWIC should undertake a careful consideration of potential modifying factors to be used in interpreting decline criteria.

Several modifying factors can be taken into account in interpreting the decline criterion (or other criteria; e.g., absolute numbers, genetic diversity, vulnerability to disease). The relevance of modifying factors will be case specific, as will the availability of information.

The absolute population size is a factor to consider in interpreting the degree to which a given decline provides a reliable metric of extinction probability. Some participants felt that the appropriate critical values for absolute remaining population size (criterion C) generally should be much larger for many marine fish species than for many other taxa (e.g., FAO 2001).

The interpretation of absolute population size should consider other modifying factors because population size alone is not sufficient for evaluating probability of extinction. The relationship of absolute population size to effective population size should be clarified in assessments, in cases when they are unlikely to be similar.

In interpreting the absolute population size relative to a population's decline, the degree to which the decline is continuing should have a great deal of weight. The weaker the evidence that the rate of decline is decreasing as the abundance declines, the less importance should be given to how many individuals are left. Also, the steeper the slope of the decline overall, the less weight should be given the remaining population size.

Extent of Decline vs. Rate of Decline

Extent of decline: Extent of reduction should be calculated from the average

unfished (historic) baseline and not from a recent short-term peak. Use as long a time series as possible, which may mean using multiple information sources to establish a baseline.

Rate of decline: Decline in recent years or recent generations (used in COSEWIC quantitative criteria, http://www.cosewic.gc.ca/pdf/assess_proc_e.pdf, Table 2).

There was a difference of opinion regarding whether extent of decline from the historic baseline should be a modifying factor for the existing decline criterion (criterion A), a replacement for it, or an additional criterion. There was agreement that the history of the population and particularly its exploitation history will be important to interpreting the degree to which extent or rate of decline are informative about the probability of extinction.

Because of the diversity of interpretations of "decline" (e.g., extent of decline vs. rate of decline), each status report should make clear which one is being used.

The Interface of Management and Conservation

There is a need to clarify the relationships between reference points used in fisheries management and criteria used by COSEWIC, and where possible, to harmonize them. Many participants argued that it is important to ensure that the zones for threatened and endangered do not overlap the zone of fisheries management reference points. Others argued that, at least in some cases, there is no need for this concern, as commercial exploitation would have ended already by the time a population decline triggered assessment by COSEWIC (Dulvy et al. in press). How close the boundaries between fisheries management reference points and criteria used by COSEWIC should be is a crucial question with both a science and a policy component. The group had neither consensus on how close they should be, nor necessarily even if a scientific basis for positioning exists.

3.3 What is the evidence for large-scale or local extinction of marine fish?

Issue: There are few recorded extinctions of entire species.

Questions: What do we really mean by 'extinction'? At what point does a 'management' problem become a 'conservation' concern because recovery becomes unlikely? What factors affect recovery rates? What is the evidence for major ecosystem shifts following severe stock depletion? Do the life-history characteristics of marine fish make them less likely to become extinct than other taxa for a given population size?

The COSEWIC definition for extinction seems appropriate (a wildlife species that no longer exists). Some participants, however, questioned whether "extinction" should be used to refer to the disappearance of the last individual of a species, or the point at which numbers are so low that the species no longer plays an ecological role in its environment. "Imminent" probability of extinction can be informed by COSEWIC's criterion E (e.g., 20% chance of extinction in the longer of 20 years or 5 generations; http://www.cosewic.gc.ca/pdf/assess_proc_e.pdf)

There are many examples of local extinctions of marine fish. There are few examples of species-level extinctions (Dulvy et. al 2003). It should be noted, however, that because many marine fish species are widely distributed, "local" extinctions can occur at a large scale.

The ability to predict future population trajectories often declines as the size of the population declines, so uncertainty increases. A precautionary approach should be used in such cases.

Zones of unacceptable risk to fisheries (outside biological stock abundance limits) overlap with higher probability of extinction and possibly low likelihood of recovery; recruitment can be impaired.

Likelihood of recovery is difficult to predict, however, we can identify conditions that need to be met for recovery to occur.

There was consensus that major ecosystem shifts have occurred following severe stock depletion. Examples discussed included dramatic increases in the abundance of shrimp following the collapse of Atlantic cod throughout much of the North Atlantic (Worm and Myers 2003), and increases in pelagic fish concomitant with declines in the abundance of groundfish (Hutchings and Baum 2005).

Communication of processes and results

COSEWIC needs to better communicate what it means by "imminent" and "extinction" to ensure that all members of COSEWIC and the public understand what each assessment means. Both terms are already defined by COSEWIC.

COSEWIC should strive for better communication of its processes and assessments:

- The process COSEWIC uses to derive a status assessment (i.e., use of quantitative guidelines followed by expert opinion decision-making; http://www.cosewic.gc.ca/pdf/assess_proc_e.pdf) seems appropriate;
- Provide more comprehensive and detailed reason for a species' designation, capturing the essence of the discussion at the assessment meeting, and how different information sources contributed to conclusions. The reason for designation should also emphasize importance of the species to biodiversity;
- Better explanation of the COSEWIC process should be reflected in the FAQs on the COSEWIC website; and
- Explain any relationship between designatable units and management units so that people understand the assessment better.

COSEWIC should communicate why some criticisms and information obtained during the review process are not accepted as central to the status report and/or assessment. A written response on main issues raised by jurisdictions could be

provided. Significant divergences of scientific interpretation should be addressed in the report.

Improving the review process to increase the quality of reports and assessments
COSEWIC should continue to ensure that all available data are incorporated into reports:

- There needs to be a cooperative approach during the preparation and review of species status reports; both COSEWIC and the jurisdictions involved can improve in key areas.
 - Continue to ensure that jurisdictional data (inventories and analysis) are obtained and incorporated into status reports before COSEWIC assessment and SARA listing.
 - There was consensus that jurisdictions need to pay earlier attention to the candidate lists so that key information can be collected to support assessments and reduce uncertainty.
- Six-month interim reports should be provided to a broad range of experts to ensure that no relevant data or interpretations are overlooked.
- COSEWIC needs to investigate ways to access reliable community knowledge throughout its process (e.g., using accepted social science methodology, atlas programs that have been established for birds, Fisherman Research Society in Nova Scotia, sociological studies looking at different fishing patterns through time).
- Engagement of community and other stakeholders will increase the confidence that stakeholders have in the COSEWIC species assessment process.

The life-history characteristics of marine fish do not make them any less likely to become extinct than other taxa.

There is much variability in probability of extinction for marine fish: low-productivity species such as sharks, skates and rays are predicted to have higher extinction probabilities than high-productivity species such as herring (Hutchings 2001a,b; Dulvy et al. 2003). There is some archaeological evidence that marine fish haven't become extinct as often as other species (McKinney 1997). However, there should not be complacency about marine fish extinction.

Important life-history and other ecological characteristics to consider for marine fish include: habitat, life history (including very low fecundity for some species), genetic drift, susceptibility to bycatch, concentrated and predictable spawning locations, Allee effect, environmental variability, multi-species interaction (e.g., Reynolds et al. 2002; Dulvy et al. 2003; Hutchings and Reynolds 2004; see also section 3.4).

3.4 What life-history and other ecological characteristics of marine fish affect their probability of extinction?

Questions: Fecundity? Age at first reproduction? Use of certain habitats? Susceptibility to different fisheries? Trophic level? How should these variables be included in an assessment of probability of extinction?

Marine fish are as vulnerable to extinction as other taxa at similar population

levels and with similar life-history traits. There was consensus that even though marine fish have highly diverse life-history characteristics, they are not different from other taxa with regard to this diversity. Additionally, there is no reason to believe that marine fish species are any more or less resilient than other taxa in their responses to threatening processes, including exploitation, habitat loss, environmental changes, and pollution. There is no evidence that highly fecund species are any more resilient than less fecund species. Life-history traits such as body size and age at maturity can be used to predict vulnerability of fishes to specific threatening processes, in the same way that they predict vulnerability of terrestrial species (Reynolds 2003).

Loss of populations is the first step towards global extinction. There are a few hundred documented examples of local marine fish extinctions (although the various causal factors, including fisheries, have not been established in many cases), but very few examples of species extinctions (Dulvy et al. 2003). However, normally, loss of populations is the first step towards global extinction. Although it is difficult to scale-up local losses to global extinction in widespread species of marine fishes, it is conceptually no different from making similar extrapolations in other taxa.

Even if there are millions of individuals remaining after a significant decline, the population may still have a high chance of becoming extinct. The number of individuals remaining after a population decline may not be as important as other factors. For example, the viability of the remaining population may be affected by size of individuals, condition, age and size at maturity, viability of eggs, recruitment rate, spatial distribution and population structure of remaining individuals, and by how these variables change over time.

COSEWIC's application of the life-history guidelines is an integral part of the assessment process (http://www.cosewic.gc.ca/pdf/assess_proc_e.pdf, Table 5). However, the guidelines can be enhanced:

- There is no evidence that high fecundity makes fish populations particularly resilient to, or likely to recover from, human impacts (Sadovy 2001). Therefore fecundity should not be used as part of the criteria for assessing vulnerability to extinction or potential for recovery. (Add this as footnote to Table 5)
- The level of threat to important habitats for various life stages is an important consideration during the assessment, but it is particularly weakly documented for nearly all marine species.
- In its assessments, COSEWIC should continue to consider effective conservation, protection and management measures that may be in place.
- Species that aggregate at certain stages of their life cycles are potentially vulnerable to human impacts, e.g., during spawning or overwintering, or in nursery areas; COSEWIC already considers these factors when calculating Area of Occupancy (A of O; tables 2 and 3), but may need to highlight this explicitly when A of O is not part of the quantitative criteria that apply to a particular species.

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5. Appendices

Appendix 1. List of Attendees.

Name	Affiliation	Mailing Address
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Appendix 2. Abstracts from presentations.

1. Clarifying objectives and terminology about risk (Randall M. Peterman)

To identify appropriate, measurable indicators of biological risk, COSEWIC's risk assessment process for classifying fish populations (or other units) into categories of "endangered", "threatened", or "special concern" must use clearly stated objectives. For instance, if the only concern is to avoid absolute extinction, then one appropriate metric is the chance of having zero fish left at some future date. However, if an objective is to avoid persistent low fish abundance, then analysts must estimate two components of biological risk, i.e., the range of possible future abundance "states" and the probability of each one occurring. Here "state" of the fish population can also mean, for example, size/age structure of the stock, amount of depletion in biomass from the unfished state, or future ability to recover from a state of low abundance or productivity. A risk assessment process should explicitly consider how uncertainties in the original data and assumptions affect estimates of the: (1) past changes in measures of the state of the population, (2) current state of population, and (3) future changes in state of population. Management actions must also be considered. Such a process will result in estimated frequency distributions of indicators of biological risks. It is important to remember that this biological risk assessment step provides input to the risk management step, in which decision makers also consider other information not included in the biological risk assessment, e.g. economic and social risks. However, decision makers should also consider the often-ignored uncertainties in economic and social measures of risk. Based on the stated management objectives and the relative weightings placed on different indicators, decision makers will make a decision, each one implying some trade-off among various risks.

2. IUCN threatened species criteria: background, uses and abuses (Georgina Mace)

IUCN – the World Conservation Union, has maintained lists of threatened species since the 1960's. However, whereas the early lists tended to be rather *ad hoc* and based on observations and personal knowledge, major efforts in the past 15 years have been taken to develop the list into a program that meets two key goals. These goals are: (1) to identify the most seriously threatened species, and (2) to document trends in a representative range of species to provide an index of biodiversity. In practice, different processes are needed to achieve these two goals. The first requires systems to identify groups of species that are assessed in detail to identify those most in need of conservation. The second requires some more unbiased survey across species using a common approach to assessing the likelihood of extinction.

New criteria and categories for IUCN's system were adopted in 1996 and revised, following a review, in 2000. The IUCN categories and criteria aim to classify species into relative risk categories according to their likelihood of extinction, within a specified time period, under current conditions. Threat assessment is not a priority rank for conservation action, though it should contribute to the priority. Rather it is a simple method to determine the urgency with which a full assessment should be undertaken. A full assessment will determine whether the criterion-based risk assessment is accurate, and what kinds of actions are appropriate to reverse the trend. The categories, determined by the criteria, can however be used to track the overall status of selected groups, as an indicator of biodiversity.

The criteria were derived from a broad-based review of the factors that determine extinction risk to species. These are both intrinsic factors, i.e. biological traits making species more vulnerable to extinction (e.g. small population size, high variability in population size, low genetic variability, long lifespan/slow reproductive rate, specialized diet or habitat, small geographical range, low population density, high trophic level, large body size, large home range size), and the extrinsic threatening processes (habitat change, loss and degradation, overexploitation, introduced species, as well as chains of extinction from interactions among and between these processes). Whatever the exact cause, the *symptoms* of high extinction probability are (1) very small populations (facing demographic stochasticity), (2) populations under decline, -i.e.. with long term negative average growth rates (facing eventual population sizes of 0), and (3) populations with long term stable or positive growth rates but facing environmental variability causing population fluctuations that can also lead to population sizes of 0. These symptoms are the basis for the criteria A, B, C and D in the current IUCN system. Each criterion has a set of quantitative thresholds that were determined from both basic theory and from surveys of species within characteristic taxonomic and habitat groups. A species need only meet one of the criteria to qualify for listing in a particular category. Not meeting the criteria has no bearing on listing so the fact that some criteria appear inappropriate for certain species is not an issue. The criteria can be regarded as a set of alternative filters.

Data used to test species against the criteria are adjusted to reflect life history and ecological traits characteristic of individual species. For example, area of occupancy and extent of occurrence reflect habitat specialization, niche distinctiveness and fragmentation. Importantly, especially for very abundant populations and species, population size is measured only by a specifically defined measure of the number of mature individuals. This is designed to approximate the effective population size by taking account of population fluctuations, variation in reproductive success between individuals and between sexes, and any interspecific dependencies. Finally, generation time is used to scale temporal measures in the criteria to the natural timescales of different species, reflecting reproductive rate, mortality rates and lifespan. Approaches to incorporating uncertainty are now included in the criteria rules and processes.

Listing in one of the threatened categories by the IUCN criteria is expected to be only a first step for most species. The system is designed to provide a broad review of all species, not a precise assessment of any one species. Listing is intended to raise awareness about species' status, not to prescribe a particular course of action – this should be the next step. Local agencies and managers will have better information for specific analyses relevant to management. Therefore, diagnosis, analysis and then action are responses to listing, not immediate action.

IUCN's categories and criteria have been successfully applied over the past 5 years to allow improved assessments of the status of species, the areas and locations facing highest risks and to start monitoring trends over time. Problems with their application have arisen where assessors have misapplied them, e.g. changing the criteria for local or specific uses, choosing to only use certain criteria, simplifying the criteria by removing the subcriteria, omitting the generation length time scale, failing to use the definitions (especially for mature individuals), and using categories to predict extinction rates.

3. COSEWIC Assessment of Marine Fishes (Mart Gross)

COSEWIC's assessment of marine fishes involves IUCN criteria at several stages. First, at the Prioritized Candidate List stage, the Marine Fishes SSC uses the Red List software program by RAMAS, developed from IUCN criteria, to help identify those species that may be at greatest risk of extinction. The SSC also uses other sources of information (e.g., General Status Assessment by DFO; various expert inputs), and then submits its prioritized SSC Candidate List to COSEWIC for the across-taxa COSEWIC Candidate List that is put out for status report bids. Second, the COSEWIC Status Reports use a template that highlights the IUCN criteria in the organization and analysis of information. The Marine Fishes SSC then extracts from the Status Report the information needed to evaluate the status of the species against the IUCN criteria. The SSC's analysis is then submitted to COSEWIC, showing for each IUCN criteria the status that would be assigned if only the criteria were followed. Third, the COSEWIC assessment reviews the information provided by the SSC and again discusses the information in the status report against the IUCN criteria, finally determining the status and recording in the meeting minutes the IUCN criteria which qualify. Finally, the COSEWIC status assignments (e.g., endangered, threatened, special concern) closely follow but are not exactly the same as those of the IUCN. Throughout this process, COSEWIC is guided by the IUCN criteria but does not use the IUCN criteria in a prescriptive manner.

COSEWIC has currently assessed 20 marine fishes. Of these, 11 were designated as endangered or threatened. For all species, the IUCN decline rate criterion was applied (for 1 species, a population viability analysis (PVA) was also available). This contrasts with other taxa where all 5 criteria are applied depending on the species, and the decline rate is usually applied to less than one-quarter of the species. The difference among taxa appears to reflect the capacity of the Marine Fishes SSC to extract information from fisheries and survey data that may not be available for other taxa.

Six of the marine fishes are designated endangered, and have an average decline rate of 87% over the time period analyzed (usually 3 generations). Five are designated threatened, and have an average decline rate of 92%. The fact that threatened species have a slightly greater average decline rate than endangered species reflects the use by COSEWIC of additional factors than just IUCN decline rate criteria. A comparison of endangered and threatened listings shows that the former had continuing declines, and/or very small populations (<1000 mature individuals) compared to the latter. COSEWIC has also designated a marine fish as special concern when the IUCN decline criteria would suggest it is endangered. In this case, the large number of individuals still remaining was a factor in the designation by COSEWIC.

In summary, COSEWIC uses the IUCN criteria to help initiate its prioritization of marine fishes for assessment, it uses the criteria as non-prescriptive guidelines for designation of status, and it uses the criteria to standardize the documentation. In practice, however, the IUCN criteria have had limited application for designation of the status of marine fishes. This is for two reasons. First, only one of the five IUCN criteria, decline rate, is being widely applied because data on declines are available and because many marine fishes do not fall into the other criteria. Second, the rate of decline of the marine fishes pre-selected for assessment has greatly exceeded that of the IUCN decline rate criteria and thus the criteria are not themselves triggering the designations. The primary threat factor for marine fishes has been fisheries exploitation (leading cause in at least 10 of 11 species), and the rate of decline for endangered and threatened species has averaged about 90% across 3 or more generations in most COSEWIC designations. These species are considered at risk of extinction because of

the marked declines in their number, and additional life history attributes. COSEWIC does not use the IUCN criteria in a prescriptive, narrow or rigid manner but rather as a guide in the assessment process.

4. Are fish different? Biological correlates of threat status in comparison with terrestrial taxa. (John Reynolds)

Should we assess the threatened status of fish species using different criteria from those used for other groups of organisms? Perhaps fish respond differently to the two major threats that they and terrestrial species face: habitat loss and over-exploitation. I consider whether we can use basic principles derived from studies of ecology and life histories of other taxa to predict how fish species will respond. Our comparative studies of marine fishes have provided strong support for the 'big=vulnerable' paradigm. This is not only due to greater fishing mortality on large-bodied species, but also due to demographic effects of correlated life histories, such as late age at maturity. However, comparative studies of freshwater fishes suggest a more complicated picture. Whereas large-bodied species are more at risk when direct exploitation is the main human impact, we found the opposite result when habitat loss is the problem, with small-bodied species facing higher risk of extinction. These findings match new research in birds, mammals, and reptiles. That is, for all species, including fishes, we can predict responses to habitat loss and over-exploitation according to the same life history traits.

For COSEWIC, there are three conclusions. First, the evidence is that fishes and terrestrial animals have similar biological correlates of threat status: they respond in the same way to extrinsic problems according to intrinsic characteristics of their biology. Second, modifications can be made to COSEWIC's guidelines for threat assessments, particularly the criteria in Table 5 involving age at maturity and body size. Third, the guidelines should continue to ignore fecundity, as there is no evidence to support the contention that high fecundity has anything to do with the responses of fish (or other animal) populations to human impacts.

5. Perceptions and caveats regarding the assignment of extinction probability in marine fish (Jeff Hutchings)

Two key perceptions provide the basis for many management strategies, recovery plans, and conservation programmes for marine fish. The first is that marine fish have lower probabilities of extinction than other taxa. This purportedly increased resilience has been variously attributed to high fecundity, extraordinary temporal variability in abundance, broad dispersal distances, and higher rates of maximum population growth. The second perception is that fishing mortality is the primary, or sole, factor limiting the recovery of over-exploited populations. Contrary to the first perception, there is neither theoretical nor empirical support for the assertions that high fecundity confers increased resilience, that the breeding population sizes of marine fish are more variable than those of birds and terrestrial mammals, that marine fish have faster rates of population growth than other taxa, or that they are more likely to recover following historically unprecedented declines. Regarding the second perception, empirical analyses indicate that while reductions in fishing pressure are necessary for recovery, they are often not sufficient to ensure recovery.

Key questions concerning the extinction probabilities of marine fish pertain to: (a) the possibility that minimum viable population sizes for marine fish are considerably greater than those of other taxa; (b) the spatial scale of population structure and adaptive variation (relevant to the identification of appropriate designatable units); (c) the relationship between census population size and both the effective genetic and demographic population sizes; and (d) the genetic basis of, and consequences to recovery resulting from, life history trait changes (such as reductions in age and size at maturity) concomitant with prolonged over-fishing.

6. Revision of the Criteria and Guidelines for Listing Species on CITES Appendices (Pamela M Mace)

The (descriptive) criteria and (numeric) guidelines used by the Convention on International Trade in Endangered Species of Fauna and Flora (CITES) to list species on its Appendices (Appendix I – most international trade banned, or Appendix II – international trade permitted but closely monitored) were revised over a 4-5 year period prior to their adoption in October 2004. The U.S. National Marine Fisheries Service, U.S. Fish and Wildlife Service, and FAO contributed substantially to the revision, particularly with respect to the need to ensure that CITES guidelines are relevant for commercially-exploited marine species (Mace et al. 2002; FAO 2001, 2002). These organisations also considered previous work conducted by IUCN, the American Fisheries Society (Musick 1999), and other groups in their deliberations.

Several innovative concepts were ultimately adopted by CITES' Parties. The extent of decline relative to some historical baseline was accepted as a valid indicator of extinction risk. In addition, it was agreed that the magnitude of the decline that should be used to trigger concern for a given species (and therefore to trigger further, more detailed analysis) should be a function of the productivity of the species, with high productivity species being expected to experience and rebound from greater magnitudes of decline, as a result of their life history characteristics. It was recommended that declines down to the level of 5-30% of the baseline be used as triggers, with the larger decline (down to 5% of the baseline; i.e. a decline of 95%) being used for high productivity species, and smaller magnitudes of decline being applied as productivity declines. For marine species, a range of 5-20% was believed to be more appropriate, with 5-10% applying for high productivity species, 10-15% for medium productivity species, and 15-20% for low productivity species. FAO (2001a) quantified the life characteristics associated with these three productivity levels.

Modifying factors (both vulnerability factors and mitigating factors) may be relevant to interpreting the consequences of the magnitude of the extent of decline, and CITES now includes a non-exhaustive list of such factors. The new revision also places a lessened emphasis on generation time as a period for evaluating declines. Declines should be evaluated over the longest possible historical period, and all relevant data and inferences should be included in the analysis. Finally, there is now a more operational approach to Appendix II (although only for marine species). Appendix II guidelines are (i) an extent of decline that is 5-10% above the Appendix I guidelines, or (ii) a current rate of decline that will lead to the Appendix I extent of decline guidelines being met within the next 10 years. In this sense, Appendix I and Appendix II guidelines might be thought of as being somewhat analogous to "endangered" and "threatened", respectively.

- FAO 2001. A background analysis and framework for evaluating the status of commercially-exploited aquatic species in a CITES context. *Second Technical Consultation on the Suitability of CITES Criteria for Listing Commercially-Exploited Aquatic Species*. FI:SLC2/2001/2. 19pp.
- FAO 2002. Report of the Second Technical Consultation on the Suitability of CITES Criteria for Listing Commercially-Exploited Aquatic Species. *FAO Fisheries Report No. 667* [English, French and Spanish]. 87pp.
- Mace, P.M., A.W. Bruckner, N.K. Daves, J.D. Field, J.R. Hunter, N.E. Kohler, R.G. Kope, S.S. Lieberman, M.W. Miller, J.W. Orr, R.S. Otto, T.D. Smith, N.B. Thompson, J. Lyke and A.G. Blundell. 2002. NMFS / Interagency Working Group Evaluation of CITES Criteria and Guidelines. *NOAA Technical Memorandum NMFS-F/SPO-58*. 70 pp.
- Musick, J. A. 1999. Criteria to define extinction risk in marine fishes. *Fisheries* **24**(12):6-12.

7. Patterns of disassociation: fecundity, recovery potential and extinction risk (Yvonne Sadovy)

There has long been an assumption that fish species producing large numbers of pelagic phase eggs/larvae, and that are commercially exploited, are particularly resilient to the threat of extinction, or able to recover readily from very low population levels. Partly for this reason, there has been less concern over extinction risk and more optimism over the potential for severely reduced populations to recover once fishing pressure is released, than is warranted.

There is little empirical support for high fecundity and resilience being positively associated in fishes, nor evidence that compensatory responses occur more in this group than in other taxa. The reason for this is that fish life history requires them to produce a great many eggs to ensure the survival of a few, since mortality rates in the egg and larval stages are so high. Long life and sporadic spawning (i.e. in a range of different long-lived species, females do not necessarily reproduce every year) is another facet of this life history strategy, compared with a mammalian strategy, for example, in which a few young are produced each with a much higher chance of success. Therefore, many years and millions of eggs may be needed for fecund fishes to replace themselves, and only some years might produce successful recruitment or be environmentally suited for long-lived adults to spawn. Indeed, several threatened commercially exploited species are large, long-lived and highly fecund (specific examples of threatened species are the Nassau grouper, *Epinephelus striatus*, and the Giant yellow croaker, *Bahaba taipingensis*).

While there are examples of compensatory responses to heavy fishing in some fish stocks, such as reduced age of sexual maturation, increased fecundity or growth rates, such responses have not been noted in many other species or stocks. Moreover, it is not clear to what extent such compensation actually increases overall population (hence fishable stock) reproductive output, since it acts at the individual and not population level. Therefore, there is no sound reason to suppose that compensatory responses occur as populations become seriously reduced. Since there is no evidence that maximum reproductive rates in pelagic spawning fish species exceed those of other taxa, there is no *a priori* reason to treat declines in fecund fish any less conservatively.

8. Do threat criteria produce false alarms? (Nicholas Dulvy)

Threat listing of exploited marine species has been controversial because of the scientific uncertainty of extinction risk as well as the social, economic and political costs of management procedures that may be triggered by designation of species as threatened. We apply three threat criteria to 76 stocks (populations) of 21 exploited marine fish and invertebrate species. Two criteria are based on decline rates: World Conservation Union (IUCN A1) and the American Fisheries Society (AFS). The third set of criteria, based on population viability (IUCN E), is assessed using non-parametric simulation and two diffusion approximation methods. We compared extinction risk outcomes (threatened or not) against the exploitation status of each stock as reported in fish stock assessments (inside or outside safe biological limits). For each combination of threat and exploitation we assessed the rate of *hits*, *misses* and *false alarms*. Our analyses suggest that decline rate criteria provide risk categorisations consistent with population viability analyses when applied to exploited marine stocks. Nearly a quarter of the fish and invertebrate populations ($n=18$) considered met one or more of the threat criteria. None of the threat metrics produced *false alarms* – where sustainably exploited stocks were categorised as threatened. The quantitative IUCN E metrics both produced higher *hit* rates than the decline rate metrics (IUCN A, AFS) and all of the metrics produced similar *miss* rates. However the IUCN E methods could be applied to fewer stocks (12-14) compared to IUCN A decline rate criteria and AFS criteria, both of which could be applied all 76 stocks. Threat criteria are met only after fisheries limit reference points have been exceeded. Our results suggest that scientists with different backgrounds and objectives should usually be able to agree on the stocks for which the most urgent management action is needed. Moreover, IUCN decline rate metrics may provide useful indicators of population status when the information needed for full fisheries stock assessment is not available.

9. Industry viewpoint (Bruce Chapman)

The mandate for conservation of marine fish rests with the Minister of Fisheries & Oceans under the Fisheries Act. COSEWIC's mandate under the Species At Risk Act (SARA) is limited to assessing the risk of extinction of marine fish. "Extinction" is defined in Webster as "no longer existing". The Parliament of Canada did not intend that COSEWIC be mandated to address the conservation of marine fish beyond what was directly related to the threat of extinction.

There are only three known extinctions of true marine fish at the species level, and these were not as a result of overfishing. Extinctions and extirpations of marine fish at the population level have all involved loss of very specific types or localized habitat, and/or are characterized by low fecundity, high age at maturity and/or low mobility. Criteria and its application related to risk of extinction should be judged against the backdrop of actual extinctions.

In addition to the debate as to whether the current criteria are appropriate for marine fish because of their biological characteristics, there are other important considerations. We cannot see fish to count them. There are parts of the sea bottom where most sampling or fishing gear cannot operate, so that there are refugia even where there are no legislated protected areas. While research vessel sampling might function adequately to create survey (or minimum trawlable) estimates of abundance and to detect changes in relative abundance over time, it seems to be a rather blunt instrument in the context of assessing abundance related to risk of extinction.

All sets of criteria agree that natural fluctuations should not be considered a decline, but go on to say that a decline should not be considered part of a natural fluctuation unless there is evidence for this. It seems unacceptable to manage risk simply on the basis of reverse onus.

The option of combining different population components of a species has obvious merit when considering risk of extinction at a species level, but in the marine fisheries context does not make much sense when each stock is harvested separately and can be subjected to stock specific management controls.

Managed exploitation conducted under the authority of the Fisheries Act, particularly when structured within a defined Precautionary Approach framework, should be a factor explicitly recognized by listing criteria for the respective species. Where they exist, Limit Reference Point(LRPs) for spawning stock biomass levels should be the demarcation point below which designation of "Special Concern" should be triggered. Designation of "Threatened" status should be triggered at appropriate points significantly below the LRP.

For stocks managed by DFO, COSEWIC's assessment process should be integrated into DFO's Regional Advisory Process.

Industry factual and interpretative knowledge should be accessed by COSEWIC in a meaningful way.

10. The American Fisheries Societies analysis of extinction risk in marine and diadromous fishes of North America (John A. Musick)

In evaluating the risk of extinction of marine fishes The American Fisheries Society (AFS) recognizes populations or Distinct Population Segments (DPSs) within species when the information is available. Categories of risk recognized include *endangered*, *threatened*, *vulnerable*, and *conservation dependent*. The IUCN system of using standardized quantitative risk criteria, although laudable in intent, is not very useful in predicting risk of extinction and, in fact, may be arbitrary because it ignores much of the enormous range in life history parameters and other ecological features that contribute to the vulnerability of different taxa. The IUCN decline criteria in populations often over-exaggerate extinction risk in fishes.

Instead, AFS developed the following criteria to evaluate the risk of extinction among fishes taking into account the context of the biology of the DPS under consideration: Rarity, Specialization in Habitat Requirements and Endemicity or Small Range, all of which are assessed qualitatively considering the unique conditions associated with each DPS. Population Decline, another criterion, is evaluated quantitatively according to the productivity or resilience of the DPS in question with four levels of productivity defined (High, Medium, Low, and Very Low). These productivity levels may be estimated using the intrinsic rate of increase, age at maturity, maximum age, the Von Bertalanffy growth coefficient, and to a lesser extent fecundity, whichever data are available.

The AFS criteria seek to identify DPSs at risk at a sufficiently early stage to avoid listing as *threatened* or *endangered* but try to minimize the probability of exaggerating the extinction risk. The AFS criteria attempt to utilize the best current knowledge of stock dynamics at low population levels, and retain the flexibility to allow experts with the greatest knowledge to contribute to the determination of the conservation status of DPSs. Initially DPSs that may be in trouble are classified as vulnerable, then

subsequently assessed by experts to determine by consensus whether to increase the risk level to threatened or endangered.

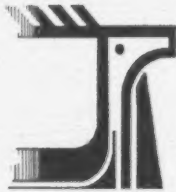
Using this system AFS published a list of marine and diadromous fishes at risk of extinction in North America (exclusive of Pacific salmonids). They recognized 82 species and subspecies of marine fishes which included DPSs vulnerable to extirpation (or worse) in North American waters. Many of these are vulnerable to more than one risk factor. The analyses of risk factors showed that life history limitations (51 species or sub-species) were by far, the most important, followed by habitat degradation (33 species or sub-species). Twelve species each were listed as endemic (or with small range) and/or as rare. Virtually all species that scored in these two categories were also vulnerable because of life history limitations or habitat degradation or both. Twenty two species could be considered to be at least *vulnerable* to global extinction, because all their DPSs were found to be at risk or because some species were comprised of one DPS, whose entire range was included in the assessment.

Among groups that are particularly vulnerable because of life history limitations are 14 scorpaenids, 13 serranids (mostly large species), 11 elasmobranchs, 5 sturgeons, and small numbers in other families. Most species that are vulnerable because of life history limitations are large (>50 cm TL) in size. Probably the greatest threat to these species with low productivity are analysis of extinction risk in marine species.wpd mixed species fisheries, where more highly productive species continue to drive the fishery, while those with low productivity are reduced to stock collapse or extirpation. Among those groups identified to be vulnerable because of habitat destruction or degradation, 18 are anadromous (ascending from the sea into freshwater to spawn) or amphidromous (ascending from the sea into freshwater habitats but not for the purpose of spawning). Five species or subspecies of sturgeons are in the diadromous group, followed by five gobies, three smelts, two snooks, one syngnathid, one alosine herring, and the Atlantic salmon. Freshwater habitats in general are more vulnerable to anthropogenic perturbation than most marine habitats, and the preponderance of diadromous species in this list comes as no surprise. The well documented plight of Pacific coast salmonids provides ample documentation of this fact. The sturgeons are of particular concern because they are doubly at risk, having late maturity and long life spans in addition to being subjected to disruption or destruction of spawning and nursery habitats.

Among other groups that were found to be at risk because of threats to habitat, five syngnathids, one sciaenid, and one goby inhabit sea grass beds which have undergone (and continue to undergo) massive destruction along the south-eastern coast of the U.S. Likewise, four species of cyprinodontiform fishes were recognized to be at risk because the mangrove or marsh grass habitats that they require have been destroyed by human development. The vast majority of species recognized to be at risk because of habitat degradation are small in size (<250 mm TL) (with the obvious exceptions of the sturgeons, Atlantic salmon and a few others). The single most important factor in habitat degradation is mismanagement of freshwater systems that directly affect diadromous species or indirectly affect estuaries or marine ecosystems by altering natural freshwater inflow.

11. The Threatened Status of Chondrichthyan Fishes (Jack Musick) (abstract not available)

APPENDIX II **PRESS RELEASES**



COMMITTEE ON THE
STATUS OF ENDANGERED
WILDLIFE IN CANADA

COMITÉ SUR LA SITUATION
DES ESPÈCES EN PÉRIL
AU CANADA

Ottawa, Ontario, November 26, 2004

Alien species threaten Canadian biodiversity

Number of Canadian species at risk increases to 455

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) met in Ottawa on November 22-25 to assess the status of several wildlife species. The American Chestnut was assessed as Endangered. Once a common tree of southern Ontario, much valued as a source of food and building materials, it was devastated by an introduced fungus. The few chestnut trees that remain are far from each other, many cannot reproduce and several are affected by the disease.

Alien invasive species, including parasites and pathogens, threaten many of the species assessed by COSEWIC. Introduced rats destroy Ancient Murrelet eggs and nestlings in the Queen Charlotte Islands, an Asiatic fungus kills Chestnut trees in Ontario, Bullfrogs brought from the east to British Columbia displace the native Red-legged Frogs and exotic grasses choke out Swamp Rose-Mallows in Ontario. "Alien invasive species are a major global threat to biodiversity. Increasingly, they have a detrimental effect on Canada's flora and fauna" said Marco Festa-Bianchet, Chair of COSEWIC.

The North Pacific Right Whale, once common off British Columbia, was severely depleted by commercial whaling in the 19th century and almost eliminated by illegal whaling a century later. Only a few tens remain in the eastern Pacific and may occasionally enter Canadian waters. This whale was assessed as Endangered.

The Copper Redhorse, a fish known only from southern Québec, was assessed as Endangered. Its population is small and declining and its habitat has been degraded by agriculture, intense human use and dams which block migration.

COSEWIC assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. To do so, COSEWIC uses scientific, aboriginal traditional and local or community knowledge provided by many experts from governments, academia and other organizations.

There are now 455 species in various COSEWIC risk categories, including 172 Endangered, 120 Threatened, 141 Special Concern, and 22 Extirpated species (no longer found in the wild in Canada). In addition, 12 are Extinct and 34 are Data Deficient.

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-jurisdictional members and the co-chairs of the species specialist and the Aboriginal Traditional Knowledge subcommittees.

Definition of COSEWIC terms and risk categories:

Wildlife Species: A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and it is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.

Extinct (X): A wildlife species that no longer exists

Extirpated (XT): A wildlife species no longer existing in the wild in Canada, but occurring elsewhere

Endangered (E): A wildlife species facing imminent extirpation or extinction

Threatened (T): A wildlife species likely to become endangered if limiting factors are not reversed

Special Concern (SC): A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats

Not at Risk (NAR): A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances

Data Deficient (DD): A wildlife species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.

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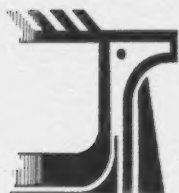
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Further details on all species assessed, and the reasons for designations, can be found on the COSEWIC website at www.cosewic.gc.ca



COMMITTEE ON THE
STATUS OF ENDANGERED
WILDLIFE IN CANADA

COMITÉ SUR LA SITUATION
DES ESPÈCES EN PÉRIL
AU CANADA

St. Pauls, Newfoundland and Labrador, May 6, 2005

500 species now considered to be at risk by COSEWIC

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) met on May 1-6, 2005 near Gros Morne National Park on the west coast of Newfoundland. The committee considered 41 reports in assessing a variety of organisms ranging from a tiny lichen to two species of whales.

The Bowhead Whale, a circumpolar Arctic whale that lives more than a hundred years, was separated into 3 populations. The Hudson Bay-Foxe Basin and the Davis Strait-Baffin Bay populations were assessed as Threatened and the Bering-Chukchi-Beaufort population was assessed as Special Concern.

The Committee also assessed four species of butterflies and moths found on remnant prairie habitats. Two of them, the White Flower Moth and Ottoe Skipper received Endangered status.

The Okanagan population of Chinook Salmon was reviewed by the Committee in response to an emergency assessment request by the Fisheries Department of the Okanagan Nation Alliance, a First Nations organization. The Committee agreed that the population met the definition of a species under the *Species at Risk Act*, that the population was Endangered. Changes in fisheries downstream in the Columbia River are expected this summer and constitute a new and imminent threat to this population.

Williamson's Sapsucker, a woodpecker associated with old-growth Western Larch forests of British Columbia, was also assessed as Endangered. The habitat for this species is rapidly disappearing due to forest harvesting.

Eighteen plant species were assessed, including the White Meconella, a globally rare poppy native to Garry Oak communities of southeastern Vancouver Island. This species is Endangered by loss of habitat because of housing developments and encroachment by alien species. Habitat loss and competition with alien species continue to be the primary threats to Canada's biodiversity, especially for those species at risk in southern Canada.

One Atlantic marine fish was assessed, the Winter Skate. The Winter Skate assessment resulted in four designations; the Southern Gulf population is considered Endangered and the Eastern Scotian Shelf population is Threatened, both due to

dramatic declines in the abundance in the populations, particularly of mature, large Winter Skates in these areas. The Georges Bank-Western Scotian Shelf-Bay of Fundy population was assessed as Special Concern. There were insufficient data to assess the status of Winter Skate, Northern Gulf-Newfoundland population

The remnant native population of Westslope Cutthroat Trout was assessed as Threatened in Alberta, with the main threat being hybridization with non-native trout. The British Columbia population is considered to be Special Concern.

The Lake Sturgeon was assessed as Endangered in western Canada and as Special Concern in the eastern parts of its range. This species has been affected throughout most of its range by a variety of threats including historical over-harvest and habitat loss from the construction and operation of dams.

Information from new studies of the Great Lakes, an area particularly rich in aquatic biodiversity, allowed COSEWIC to assess the status of several fish species including Spotted Gar, Warmouth and Spotted Sucker.

COSEWIC assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. To do so, COSEWIC uses scientific, aboriginal traditional and local or community knowledge provided by many experts from governments, academia and other organizations. These assessments are available to the public now and will be forwarded to Federal Minister of the Environment in August for consideration for listing under the *Species at Risk Act* (SARA).

There are now 487 species in various COSEWIC risk categories, including 184 Endangered, 129 Threatened, 152 Special Concern, and 22 Extirpated species (no longer found in the wild in Canada). In addition, 13 are Extinct and 39 are Data Deficient.

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three members at large and the co-chairs of the species specialist groups and the Aboriginal traditional knowledge subcommittees.

Definition of COSEWIC terms and risk categories:

Wildlife Species: A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and it is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.

Extinct (X): A wildlife species that no longer exists

Extirpated (XT): A wildlife species no longer existing in the wild in Canada, but occurring elsewhere

Endangered (E): A wildlife species facing imminent extirpation or extinction

Threatened (T): A wildlife species likely to become Endangered if limiting factors are not reversed

Special Concern (SC): A wildlife species that may become a Threatened or an Endangered species because of a combination of biological characteristics and identified threats

Not at Risk (NAR): A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances

Data Deficient (DD): A wildlife species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.

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For further information, contact:

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Chair, COSEWIC
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(819) 821-8000 ext. 2061
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Marco.Festa-Bianchet@usherbrooke.ca

General inquiries:

COSEWIC Secretariat
(819) 953-3215

www.cosewic.gc.ca

For inquiries on :
Chinook Salmon: Mart Gross (709) 243-2471 (until May 10) Cell (416) 978-3838

For inquiries on :
Williamson's Sapsucker: Dick Cannings (709) 243-2471

For inquiries on :
Butterflies and Moths : Theresa Fowler (today only) (709) 243-2471

For inquiries on :
Sturgeon: Robert Campbell (today only) (709) 243-2606

For inquiries on:
Whales: Randy Reeves (450) 458-6685 or Andrew Trites (604) 209-8182

For inquiries on:
Winter Skate : Jeff Hutchings (902)494-2687

Further details on all species assessed, and the reasons for designations, can be found on the COSEWIC website at:

www.cosewic.gc.ca

APPENDIX III

Table 1/Tableau 1:

Appointment of COSEWIC members and alternates from provinces, territories and federal agencies. The duration of the term for all members appearing in this table is 4 years and the end of term for each member and alternate is indicated in brackets() .

(* Names of new members provided to COSEWIC and recommended for ministerial nomination are indicated in bold.)

Jurisdiction	Member	Alternate
Alberta	Gordon Court (July 2007) Provincial Wildlife Status Biologist Resource Data and Species at Risk Fish and Wildlife Division Dept. of Sustainable Resource Development Government of Alberta 7th Floor, O.S. Longman Building 6909 - 116 Street Edmonton AB T6H 4P2	Steve Brechtel (July 2007) Head Resource Data and Species at Risk Fish and Wildlife Division Dept. of Sustainable Resource Development Government of Alberta 7th Floor, O.S. Longman Building 6909 - 116 Street Edmonton AB T6H 4P2
British Columbia	Dave Fraser (July 2007) Endangered Species Specialist Biodiversity Branch Terrestrial Ecosystem Science Section Ministry of Water, Land and Air Protection Government of British Columbia P.O. Box 9338 - Station Prov Govt Victoria BC V8V 9M1	Susan Pollard * (July 2009) Endangered Species Specialist Biodiversity Branch Aquatic Ecosystem Science Section B.C. Ministry of Water, Land and Air Protection Government of British Columbia P.O. Box 9338 - Station Prov Govt Victoria BC V8W 9M1
Manitoba	Dr. James Duncan (July 2007) Manager Biodiversity Conservation Section Wildlife and Ecosystem Protection Branch Manitoba Conservation P.O. Box 24 200 Saulteaux Crescent Winnipeg MB R3J 3W3	Martin Erickson(July 2008) Fisheries Biologist Aquatic Ecosystem Section Fisheries Branch Manitoba Water Stewardship Box 20, 200 Saulteaux Crescent Winnipeg, MB R3J 3W3
New Brunswick	Dr. Maureen Toner (July 2007) Biologist Species at Risk Program Fish and Wildlife Branch Department of Natural Resources P.O. Box 6000 Fredericton NB E3B 5H1	Dayne Sabine (July 2007) Biologist Species at Risk Program Fish and Wildlife Branch Department of Natural Resources P.O. Box 6000 Fredericton NB E3B 5H1

Jurisdiction	Member	Alternate
Newfoundland and Labrador (For all Species other than Marine Fish)	Joseph Brazil (July 2007) Chief Endangered Species and Biodiversity Section Inland Fish and Wildlife Division Department of Tourism, Culture and Recreation Government of Newfoundland and Labrador P.O. Box 2007 50 Main Street, Commerce Court Corner Brook NL A2H 7S1	Nathalie Djan-Chékar (July 2007) Curator of Botany Natural History Unit Provincial Museum of Newfoundland & Labrador P.O. Box 8700 St. John's NL A1B 4J6
Newfoundland and Labrador (Marine Pelagic and Demersal Fish Species)	Tom Dooley (July 2007) Director of Resource Policy and Development Policy and Planning Department of Fisheries and Aquaculture Government of Newfoundland and Labrador P.O. Box 8700 St. John's NL A1B 4J6	David Coffin (July 2007) Supervisor Fisheries Resource Planning and Development Policy and Planning Department of Fisheries and Aquaculture Government of Newfoundland and Labrador P.O. Box 8700 St. John's NL A1B 4J6
Northwest Territories	Dr. Suzanne Carrière (July 2007) Ecosystem Management Biologist Wildlife Division Department of Environment and Natural Resources Government of the Northwest Territories 600 - 5102 50th Avenue Scotia Centre, 5th Floor Yellowknife NT X1A 3S8	Tom Lakusta (July 2008) Manager, Forest Resources Forest Management Department of Resources, Wildlife and Economic Development Government of the Northwest Territories PO Box 1320 Yellowknife NT X1A 2L9
Nova Scotia	Dr. J. Sherman Boates (July 2007) Manager Wildlife Division Department of Natural Resources Government of Nova Scotia 136 Exhibition Street Kentville NS B4N 4E5	Mark F. Elderkin (July 2007) Wildlife Division Nova Scotia Dept. of Natural Resources Government of Nova Scotia 136 Exhibition Street Kentville NS B4N 4E5
Nunavut Territory	Michael Setterington (July 2007) Ecosystems Biologist Department of Environment Government of Nunavut PO Box 120 Arviat NU X0C 0E0	Vacant

Jurisdiction	Member	Alternate
Ontario	Alan Dextrase (July 2007) Aquatic SAR Biologist Species At Risk section Ontario Parks Ontario Ministry of Natural Resources P.O. Box 7000 Peterborough ON K9J 8M5	Michael Oldham (July 2008) Botanist/Herpetologist Ontario Natural Heritage Information Centre (NHIC) Ontario Ministry of Natural Resources P.O. Box 7000 Peterborough ON K9J 8M5
Prince Edward Island	Rosemary Curley (July 2007) Program Manager Protected Areas and Biodiversity Conservation Conservation and Management Division PEI Dept. Fisheries, Aquaculture and Environment 11 Kent St. P.O. Box 2000, Jones Bldg, Charlottetown PE C1A 7N8	Barry MacPhee (July 2008) Manager of Marine Fisheries PEI Department of Fisheries, Aquaculture and Environment 11 Kent St. P.O. Box 2000, Jones Bldg, Charlottetown PE C1A 7N8
Quebec (Plants)	Line Couillard (July 2007) Ministère de l'Environnement Direction du patrimoine écologique et du développement durable Édifice Marie-Guyart, 4e étage 675, boul. René-Lévesque Est Québec QC G1R 5V7	Jacques Labrecque (July 2008) Ministère de l'Environnement Direction du patrimoine écologique et du développement durable Édifice Marie-Guyart, 4e étage 675, boul. René-Lévesque Est Québec QC G1R 5V7
Quebec (Fauna)	Daniel Banville (July 2008) Société de la faune et des parcs du Québec Direction du développement de la faune Édifice Marie-Guyart 675 boulevard René-Lévesque Est boîte 92, 11e étage Québec QC G1R 5V7	Jacques Jutras (July 2008) Société de la faune et des parcs du Québec Direction du développement de la faune Édifice Marie-Guyart 675 boulevard René-Lévesque Est boîte 92, 11e étage Québec QC G1R 5V7
Saskatchewan	Jeanette Pepper (July 2007) Zoologist Saskatchewan Conservation Data Centre Resource Stewardship Branch Saskatchewan Environment Government of Saskatchewan 3211 Albert Street - Room 436 Regina SK S4S 5W6	Dr. Robert Wright (July 2008) Plant ecologist Forest Services Group Saskatchewan Environment Government of Saskatchewan 3211 Albert Street Regina SK S4S 5W6
Yukon Territory	Thomas Jung (July 2007) Senior Biologist Department of Environment Fish and Wildlife Branch Government of Yukon P.O. Box 2703 Whitehorse YT Y1A 2C6	Syd Cannings (July 2008) NatureServe Yukon Yukon Department of the Environment Box 2703 Whitehorse YT Y1A 2C6

Jurisdiction	Member	Alternate
Federal Biodiversity Information Partnership (Canadian Museum of Nature)	Dr. Robert Anderson (July 2007) Entomology Research Scientist Canadian Museum of Nature P.O. Box 3443 - Station D Ottawa ON K1P 6P4	Dr. Lynn Gillespie (July 2007) Research Scientist Canadian Museum of Nature P.O. Box 3443 - Station D Ottawa ON K1P 6P4
Environment Canada (Canadian Wildlife Service)	Dr. Theresa Fowler (July 2007) Science Advisor / Species Assessment Biologist Species at Risk Branch Canadian Wildlife Service Environment Canada Ottawa ON K1A 0H3	Diane Amirault (July 2007) Senior Species at Risk Biologist Canadian Wildlife Service Environment Canada P.O. Box 6227 Sackville NB E4L 1G6
Department of Fisheries and Oceans	Dr. Jake Rice (July 2007) Director Canadian Science Advisory Secretariat Department of Fisheries and Oceans 200 Kent Street - Station 12S032 Ottawa ON K1A 0E6	Lara Cooper (July 2008) Canadian Science Advisory Secretariat Fisheries and Oceans Canada 200 Kent Street Station 12S032 Ottawa ON K1A 0E6
Parks Canada	Dr. Gilles Seutin (July 2007) Coordinator Species at Risk Program Parks Canada 25 Eddy Street, 4th Floor Gatineau QC K1A 0M5	Dr. Peter L. Achuff (July 2007) National Botanist Ecological Integrity Branch Parks Canada Waterton Lakes National Park Waterton Park AB T0K 2M0

Table 2/ Tableau 2: Co-chairs of the Aboriginal Traditional Knowledge Subcommittee and Species Specialist Subcommittees, with dates of appointment and the ending date of their terms of office.

Names of new/renewed members recommended by COSEWIC for ministerial appointment for a term starting January 1st, 2006 are indicated in bold.

SUBCOMMITTEE	NAME	DATE APPOINTED	TERM ENDING
Aboriginal Traditional Knowledge	Henry Lickers Mohawk Council of Akwesasne Department of the Environment P.O. Box 579 Cornwall ON K6H 5T3	05/06/2003	31/12/2006
	Larry Carpenter Wildlife Management Advisory Council - Northwest Territories P.O. Box 2120 Inuvik NT X0E 0T0	05/06/2003	31/12/2007
Amphibians and Reptiles	Dr. Ronald J. Brooks Department of Zoology College of Biological Science University of Guelph Guelph ON N1G 2W1	05/06/2003	31/12/2006
	Dr. David M. Green Redpath Museum McGill University 859 Sherbrooke Street West Montréal QC H3A 2K6	05/06/2003	31/12/2008
Birds	Richard Cannings 1330 East Debeck Road R.R. 1, Site 11 - Comp. 96 Naramata BC V0H 1N0	01/01/2005	31/12/2008
	Dr. Marty L. Leonard Department of Biology Dalhousie University 1355 Oxford Street Halifax NS B3H 4J1	05/06/2003	31/12/2006
Freshwater Fishes	Dr. Robert Campbell * 983 Route 800 E R.R. #1 St. Albert ON K0A 3C0	05-06/2003	31/12/2009
	Dr. Claude Renaud Adjunct Professor, University of Ottawa Research Scientist – Ichthyology Canadian Museum of Nature P.O. Box 3443 – Station D Ottawa ON K1P 6P4	05/06/2003	31/12/2007

SUBCOMMITTEE	NAME	DATE APPOINTED	TERM ENDING
Arthropods	Dr. Theresa Fowler Science Advisor / Species Assessment Biologist Species at Risk Branch Canadian Wildlife Service Environment Canada Ottawa ON K1A 0H3	01/01/2005	31/12/2008
	Dr Paul M. Catling Research Scientist and Curator Biodiversity, National Program on Environmental Health Agriculture and Agri-food Canada, Research Branch Wm. Saunders Bldg., Central Experimental Farm Ottawa, ON K1A 0C6	01/01/2005	31/12/2008
Molluscs	Dr. Gerald L. Mackie Department of Zoology College of Biological Science University of Guelph Guelph ON N1G 2W1	05/06/2003	31/12/2006
	Janice L. Smith Aquatic Ecosystem Impacts Research Branch National Water Research Institute Environment Canada Burlington ON L7R 4A6	01/01/2005	31/12/2008
Marine Fishes	Dr. Howard Powles* 53 rue Lortie Gatineau, Qc J9H 4G6	01/01/2006	31/12/2009
Marine Fishes	Dr. Mart R. Gross Professor Department of Zoology University of Toronto 25 Harbord Street Toronto ON M5S 3G5	05/06/2003	31/12/2005
Marine Fishes	Dr. Paul Bentzen* (2 year-term by exception) Professor Department of Biology, Dalhousie University Halifax, N.S. B3H 4J1	01/01/2006	31/12/2007
Marine Mammals	Dr. Andrew Trites Director Marine Mammal Research Unit Fisheries Centre University of British Columbia 2204 Main Mall Vancouver BC V6T 1Z4	05/06/2003	31/12/2007

SUBCOMMITTEE	NAME	DATE APPOINTED	TERM ENDING
	Dr. Randall R. Reeves Okapi Wildlife Associates Hudson QC J0P 1H0	01/01/2005	31/12/2008
Plants and Lichens (Vascular Plants)	Dr. Erich Haber * c/o National Botanical Services 604 Wavell Avenue Ottawa ON K2A 3A8	05/06/2003	31/12/2009
Plants and Lichens (Mosses and Lichens)	Dr. René Belland Devonian Botanic Garden University of Alberta Edmonton AB T6G 2E1	05/06/2003	31/12/2007
Terrestrial Mammals	Dr. Marco Festa-Bianchet Department of Biology Sherbrooke University Sherbrooke, QC J1K 2R1	05/06/2003	31/12/2007
	Dr. M. Brock Fenton Department of Biology University of Western Ontario London ON N6A 5B7	05/06/2003	31/12/2005
	Dr Mark Brigham * Department of Biology University of Regina Regina, SK S4S 0A2	01/01/2006	31/12/2009

Table 3/ Tableau 3: Three (3) COSEWIC members at large with dates of appointment and the ending date of their terms of office.

NAME	DATE APPOINTED	TERM ENDING
Michael Bradstreet Ontario Region Director Nature Conservancy of Canada RR 5, 5420 Highway 6 North Guelph ON N1H 6J2	05/06/2003	31/12/2007
Dr. Steven M. Carr Department of Biology Memorial University of Newfoundland Elizabeth Avenue St. John's NL A1B 3X9	05/06/2003	31/12/2006
Dr. Jeffrey Hutchings Department of Biology Dalhousie University 1355 Oxford Street Edsell Castle Circle Halifax NS B3H 4J1	01/01/2005	31/12/2008

APPENDIX IV

BIOSKETCHES

British Columbia, new alternate member

Recommendation: Susan Pollard

Susan Pollard completed her B.Sc. and M.Sc. at the University of Guelph, specializing in salmonid population genetics. She spent the following 8 years with the Government of British Columbia as a fish biologist developing and coordinating the provincial fish conservation genetics program for freshwater fishes. She recently began a new role as the Aquatic Species At Risk Specialist for BC. The focus of this role is to oversee provincial aquatic species at risk activities from status assessment to recovery and stewardship. However, Susan Pollard is also developing a freshwater aquatic invasive species program, and will be involved in other more general aquatic conservation and management initiatives.

Susan Pollard has a broad range of experience dealing with freshwater fisheries and conservation issues. She has coordinated research projects dealing with mixed-stock fisheries problems and population structure, conducted hatchery program reviews and developed captive breeding and conservation-type hatchery guidelines. She has assisted in developing provincial policy relating to fish conservation and management. Susan also has experience in status assessment and recovery planning. Most recently, she assisted the Province of Alberta in developing recovery plans for 3 fish species at risk.

Co-chair, Plants & Lichens Specialist Subcommittee

1. Recommendation – Dr. Erich Haber (renewal)

Dr. Erich Haber is well known to COSEWIC members. He has a Ph.D. from the University of Toronto (A Biosystematics Study of Eastern North American Species of the Genus *Pyrola*). He worked 22 years as a botanist with the Canadian Museum of Nature and spent the last 11 years as a biological consultant. His recent consulting work has dealt extensively with species at risk and invasive species. He has an extensive report and publication list which spans the entire range from referred journal publications, popular articles, technical reports and online databases.

Dr. Erich Haber has shepherded over 150 COSEWIC reports through the system in his 23 year association with us, which include a term as COSEWIC's chair. He has extensive knowledge of the flora of Canada and conducted field work in eastern Canada, British Columbia, Alberta and the high Arctic. His work has involved systematics, ecology and Erich's contribution to Canadians has been widely acknowledged and awards have included the Roland Michener Conservation Award in 2000 and a service award from COSEWIC in 1998.

Co-chair Freshwater Fishes Specialist Subcommittee

2. Recommendation –Dr Robert Campbell (renewal)

Dr. Robert (Bob) Campbell is the incumbent Freshwater Fishes Co-Chair. He has proven to be highly effective in this position over the last four years. Bob Campbell has a PhD in environmental physiology and ecology from the University of Guelph and has a sound and broad working knowledge of conservation biology, systematics/taxonomy, ecology, population biology, genetics, and wildlife management. Bob Campbell has developed an excellent understanding of conservation issues related to the freshwater fishes in Canada through his work at various levels of government, as CITES Management Authority for Canada, and through his many years of work with COSEWIC.

Dr. Campbell has a significant amount of scientific writing experience, with articles published in many peer-reviewed and non-peer-reviewed texts. He also has significant editorial experience working for some time as the associate editor of the Canadian Field-Naturalist and also as stand-in-editor for the Canadian Journal of Fisheries and Aquatic Sciences. Throughout his career, Bob Campbell has also been very successful in leading consensus seeking teams and has shown great enthusiasm in his leadership role with the Freshwater Fishes SSC despite a daunting workload. As Co-Chair, he has successfully managed to bring a large number of status reports through the jurisdictional and committee review processes and to the COSEWIC table.

Co-chair, Terrestrial Mammals Specialist Subcommittee

3. Recommendation –Dr. Mark Brigham (new)

Dr. Brigham has a BSc from Queen's University, a MSc from Carleton and a PhD from York University. He is currently a Professor of Biology at the University of Regina. Over the last 17 years, Dr. Brigham has conducted research on the ecology, behaviour and conservation of bats, as well as a variety of bird species. Although bats are the focus of Dr. Brigham's research, he has a broad knowledge of terrestrial mammals, particularly those found in grassland habitats of western Canada. Dr. Brigham also teaches Conservation Biology at the University of Regina, and so has current knowledge in this area.

Dr. Brigham has experience in assessment techniques and in formulating status recommendations. He has been a member of COSEWIC's Terrestrial Mammals SSC for over five years and has also served on the Province of Saskatchewan's Scientific Committee, which provides status recommendations for plants and animals in the province.

Finally, Dr. Brigham has extensive experience both in writing and reviewing scientific articles. He has authored or co-authored over 100 peer-reviewed papers, is an associate editor of the "American Midland Naturalist" and has conducted reviews for over 30 journals and several granting agencies. He has also reviewed numerous status reports as a member of the Terrestrial Mammals SSC.

Co-chair, Marine Fishes Specialist Subcommittee

4. Recommendation –Dr. Howard Powles(new)

Dr. Powles has by far the strongest record of government service and in fisheries and endangered species management of any of the candidates. He received his Ph.D. in 1975 and just retired after a 27-year career in the federal Department of Fisheries and Oceans during which he rose to become Director of the Biodiversity Science Branch and more recently Head of the Species at Risk Secretariat. He was a member of COSEWIC from 1998 through 2004 and actively contributed to the formulation of the new COSEWIC under SARA. He chaired COSEWIC's criteria working group that pioneered the use of the IUCN-like criteria system we now employ. He is not an academic and therefore his publications output is not in the same league as the other candidates, both university professors. He has, however, produced over 30 technical reports on fisheries subjects. Given his career path, his output of scientific papers is respectable.

His knowledge of DFO, government, fisheries science and management, COSEWIC, and how to run a committee are all extremely important and valuable to have in a co-chair of this subcommittee. Because of his experience, Dr. Powles would bring to COSEWIC much knowledge of both marine fish and invertebrates. He has worked in many areas of the world and was involved with both CITES and the Convention on Biodiversity. In addition, he was Treasurer of the Canadian Conference of Fisheries Research. His involvement in this scientific society means that he is familiar with many Canadian Academic researchers and is witness to his interest in research on fisheries. As a member of COSEWIC, he contributed actively and constructively to discussions of Status Reports on species other than fish. Dr. Powles' contribution to COSEWIC as Marine Fish SSC Co-Chair would therefore not be limited to the assessment of fishes.

Finally, through his involvement in several committees, Dr. Powles revealed an uncommon ability to work to achieve consensus. He can express a contrary view while showing much professional respect for those he disagrees with, raising the quality of the discourse in discussions involving strong opinions. That is a key quality of a COSEWIC member.

Co-chair, Marine Fishes Specialist Subcommittee

5. Recommendation –Dr. Paul Bentzen (new)

Paul Bentzen is Professor of Fisheries Resource Conservation Genetics at Dalhousie University. He has 21 years of professional experience with marine fishes in both the Atlantic and Pacific Oceans but also has considerable knowledge of other organisms, having published on crustaceans, birds, mammals, molluscs and freshwater fishes. He has extensive knowledge of salmonids. His technical expertise encompasses molecular population genetics, particularly the use of DNA microsatellite markers in understanding the population biology of fishes. He has an excellent publication record and maintains a very active and well-funded research program.

Dr. Bentzen has a good record of University and professional service, having chaired numerous departmental and faculty committees and is a member of COSEWIC's Marine Fishes Subcommittee. He teaches courses in Molecular Ecology, Marine Conservation Genetics, and Evolution. Prof. Bentzen's expertise, stemming from a career devoted to

population ecology and genetics of fishes and other aquatic animals, as well as his abilities to work with others on conservation issues make him a prime candidate for a Co-Chair's position. Those who know him consider him energetic and likely to contribute actively to discussions, working groups and assessments.

Curricula vitae for all nominees and current members are on file with the COSEWIC Secretariat.

APPENDIX V

Guidelines for Recognizing Designatable Units Below the Species Level (Appendix F5 in the COSEWIC O&P Manual)

Prepared by COSEWIC in 2004

Reviewed and approved by COSEWIC in 2005¹

Preamble:

It is widely recognised that species status assessment and conservation of biological diversity require that populations below the species level (using "species" in the accepted sense of the taxonomic hierarchy) be considered when appropriate. Most legislation allows for status designation of populations below the species level. For example, the federal Species at Risk Act (SARA) includes subspecies, varieties and "geographically or genetically distinct" populations in its definition of wildlife species thus allowing for listing of populations below the species level. COSEWIC's recognition of populations below the species level for assessment (i.e. designatable units) is guided by the same general objective of preventing wildlife species from becoming extinct or extirpated.

COSEWIC strives to recognize designatable units that are significant and irreplaceable units of biodiversity yet there are difficulties inherent in achieving a uniform interpretation of the word "significant". Furthermore, because patterns of population structure, life history, and genetic variability differ across taxonomic groups, use of uniform criteria in determining appropriate designatable units *a priori* can be difficult. Guidelines are needed in order to interpret, on a case-by-case basis, what constitutes a significant element of biological diversity to be recognized for the purpose of conservation status assessment by COSEWIC.

Approach:

COSEWIC's usual approach to assigning status is, first, to examine the species as a whole and then, if deemed appropriate, to examine the status of designatable units (DUs) below the species level.

In cases where particular DUs are strongly suspected of being at risk, or where DUs are so different in distribution or conservation status that an overall assessment would not capture the conservation concerns, COSEWIC will assess single designatable units below the species level.

¹ Under the heading Approach, the word "usual" was added to the first sentence. The second paragraph has been added to better reflect COSEWIC's practises.

Under Guideline 1 "named subspecies and varieties", the text has been modified to better explain the sources of valid scientific names.

Under Guideline 4, a better and more recent example has been used.

Status may be assigned to subspecies, varieties, or geographically or genetically distinct populations which may be recognized in cases where a single status designation for a species is not sufficient to accurately portray probabilities of extinction within the species. Designatable units are to be recognized in accordance with the following guidelines.

Guidelines:

Specifically, the units to which status may be assigned below the species level are recognized on the basis of any one of the four criteria (1 - 4) described below. Typically, COSEWIC will consider, in order of precedence, 1) established taxonomy, 2) genetic evidence, 3) range disjunction, and 4) biogeographic distinction.

1) named subspecies or varieties:

published subspecies of animals according to the Code of Zoological Nomenclature or published subspecies or varieties of plants according to the Code of Botanical Nomenclature.

Examples:

Water Snake: *Nerodia sipedon sipedon* (NAR), *N. s. insularum* (E)

Loggerhead Shrike: *Lanius ludovicianus migrans* (E), *L. l. excubitorides* (T)

or,

2) units identified as genetically distinctive:

evidence of genetic distinctiveness including, but not limited to, appropriate inherited traits (morphological, life history, behaviour) and/or genetic markers (e.g. allozymes, DNA microsatellites, DNA restriction fragment length polymorphisms (RFLPs), DNA sequences, etc.).

Example:

Coho salmon: Interior Fraser River (E), as opposed to other populations

or,

3) units separated by major range disjunction:

disjunction between substantial portions of the species' global geographic range such that dispersal of individuals between separated regions has been severely limited for an extended period of time and is not likely in the foreseeable future.

Examples:

Boreal Felt Lichen: Atlantic (E), Boreal (SC)

Blanding's Turtle: Atlantic population (T), as opposed to other populations

or,

4) units identified as biogeographically distinct:

occupation of differing eco-geographic regions that are relevant to the species and reflect historical or genetic distinction, as may be depicted on an appropriate ecozone or biogeographic zone map (Figs. 1 - 3).

Examples:

Mormon Metalmark: Southern Mountain population (E), Prairie population (T).
Woodland Caribou: an assortment of designations based on biogeographic zones.

Precautions:

Appropriate caution in interpreting data should be exercised when identifying designatable units. The biological significance of phenotypic, genetic or geographic variation, must be considered in light of potential limitations in the data available. Inadequate information on temporal variability, insufficient sample sizes, or evidence from inappropriate traits (those which are either inordinately variable or overly conservative) will compromise the significance of available information.

Separate status designations should **not** be recognized for management units that are not based on biological criteria consistent with these guidelines.

Status designations should **not** be individually assigned to units below the species level if all such units within the species have the same status designation. In such cases, the status designation should be applied to the entire species.

Fig. 1. Terrestrial ecozones of Canada

COSEWIC National Ecological Areas

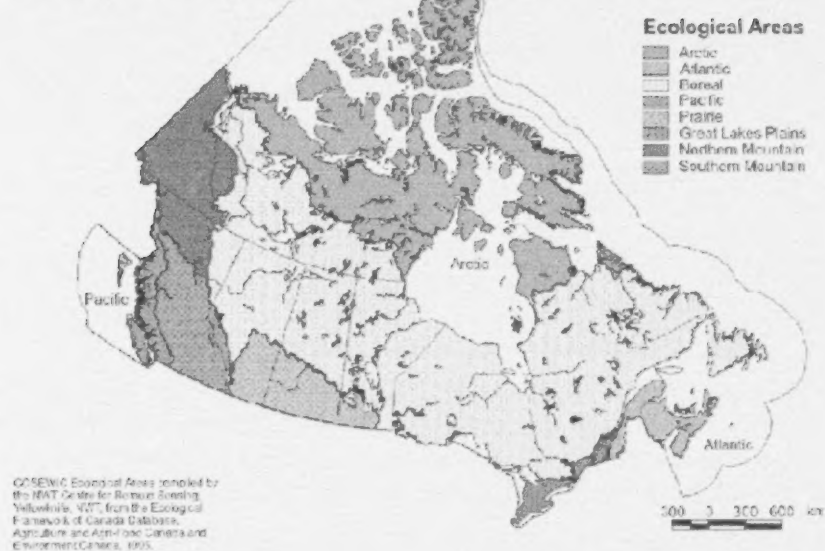
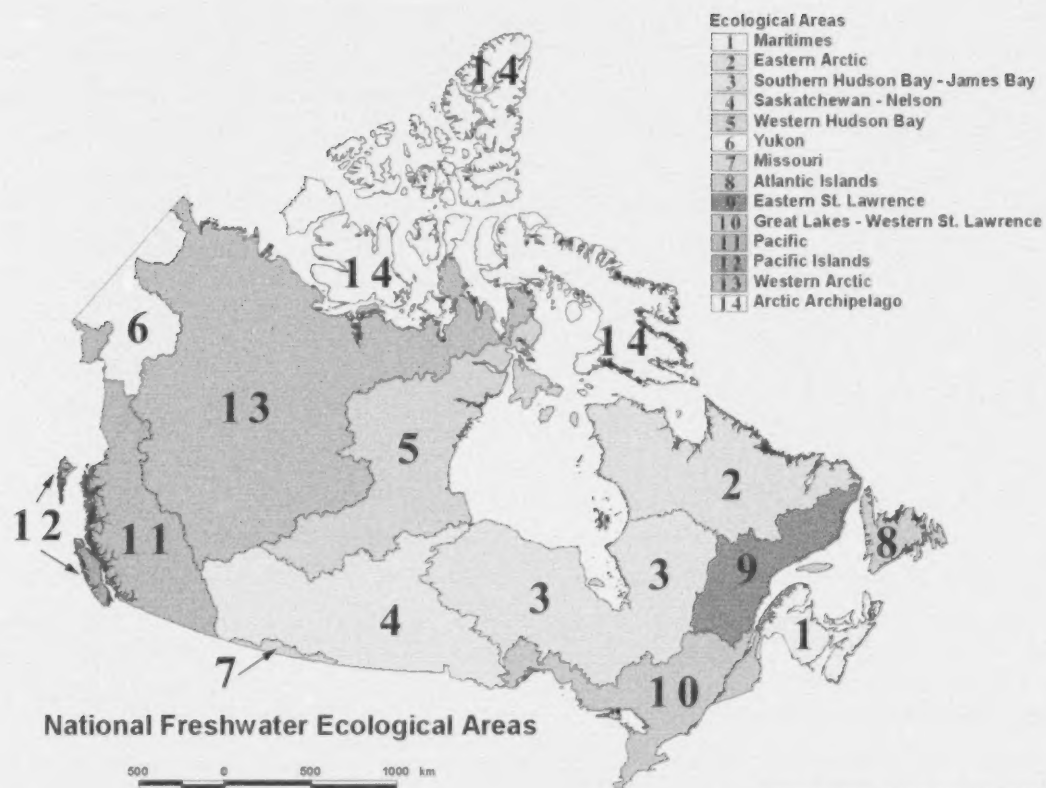
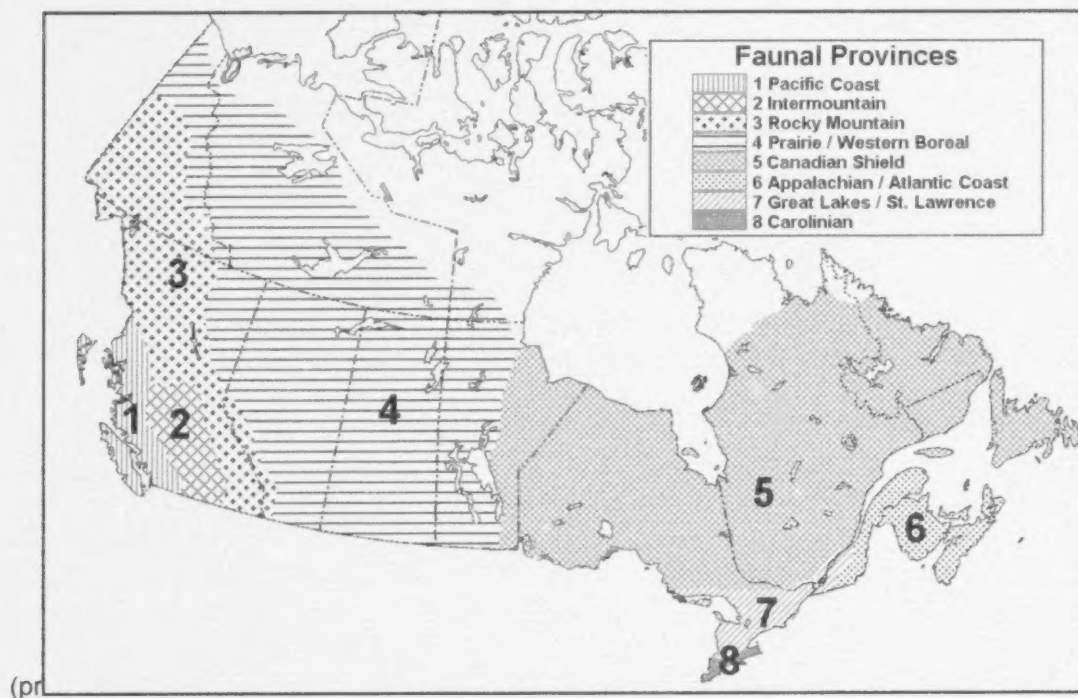


Fig. 2. Aquatic ecozones of Canada.



Prepared by N.E. Mandrak, 03/06/03

Fig. 3. Faunal provinces of terrestrial amphibians, reptiles, and molluscs in Canada.
(unpublished, prepared by David Green, Co-chair of the Amphibians and Reptiles Specialist Subcommittee, 2003)



APPENDIX VI

COSEWIC Assessment Process, Categories and Guidelines (COSEWIC O&P Manual –Appendix E3)

**Approved by COSEWIC in May 2004
Approved by CESSC in September 2004
Modifications approved by COSEWIC May 2005¹**

Table 1. Determining eligibility of species for status assessment.

A) Taxonomic validity

COSEWIC would normally only consider species and subspecies or varieties that have been established as valid in published taxonomic works or in peer reviewed communications from taxonomic specialists. COSEWIC would not normally consider other designatable units unless they can be shown to be genetically distinct, separated by a major range disjunction, or biogeographically distinct (refer to Guidelines for Designatable Units Below the Species Level, Appendix F5). Justification for considering designatable units below the species level must be provided.

B) Native species

COSEWIC would normally only consider native species. A native species is a wild species that occurs in Canada naturally, or that has expanded its range into Canada without human intervention from a region where it naturally occurred, has produced viable populations, and has persisted in Canada for at least 50 years.

C) Regularity of occurrence

¹ In Table 1, Part C, wording was added to clarify that COSEWIC would consider species that have formerly occurred regularly in Canada.

In Table 2, Criteria 4a was modified slightly to correct a minor transcription error when the IUCN criteria was adapted by COSEWIC.

In Table 2, Criteria C2a was modified slightly to correct a minor transcription error when the IUCN criteria was adapted by COSEWIC.

In Table 3, the introductory text was modified to reflect the use of the term "Designatable Unit", which supersedes (but is not equivalent to) the older term "Population of National Significance". Minor changes in the body of the table were made for clarity to more consistency use the term "extra-regional population"

COSEWIC would normally only consider species which occur or formerly have occurred regularly in Canada, excluding vagrants.

D) Requires habitat in Canada

COSEWIC considers species that are year-round residents in Canada. COSEWIC also considers a species which, although not a full-time residents in Canada, meet the other eligibility criteria and require habitat in Canada for a key life history stage.

E) Special cases

Notwithstanding the above guidelines, a taxon may be considered eligible if there are clear conservation reasons for consideration (for example high risk of extinction). In particular, a species which does not meet the eligibility criteria but which is at risk in its primary range outside of Canada could be considered for designation.

Reasons for considering a special case must be presented and supporting information must be provided; this should normally be reviewed and agreed to by COSEWIC before a status report is prepared.

Table 2. COSEWIC quantitative criteria and guidelines for the status assessment of species.

COSEWIC's revised criteria to guide the status assessment of species. These were in use by COSEWIC by November 2001, and are based on the revised IUCN Red List categories (IUCN 2001¹). An earlier version of the quantitative criteria was used by COSEWIC from October 1999 to May 2001. For definitions of terms marked in bold italics, see COSEWIC's Glossary of Definitions and Abbreviations (Appendix C).

Endangered	Threatened
A. Declining Total Population	
Reduction in population size based on any of the following 4 options and specifying a-e as appropriate:	
$\geq 70\%$	$\geq 50\%$
(1) population size reduction that is observed, estimated, inferred, or suspected in the past 10 years or 3 generations, whichever is longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) one or more of a-e below.	
$\geq 50\%$	$\geq 30\%$
(2) population size reduction that is observed, estimated, inferred or suspected over the last 10 years or 3 generations, whichever is longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) one or more of a-e below.	
(3) population size reduction that is projected or suspected to be met within in the next 10 years or 3 generations, whichever is longer (up to a maximum of 100 years), based on (and specifying) one or more of b-e below.	
(4) population size reduction that is observed, estimated, inferred, projected or suspected over any 10 year or 3 generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period includes both the past and the future, AND where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) one or more of a-e below.	
<ul style="list-style-type: none"> a) direct observation b) an index of abundance appropriate for the taxon c) a decline in area of occupancy, extent of occurrence and/or quality of habitat d) actual or potential levels of exploitation e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites 	

¹ IUCN 2001. *IUCN Red List Categories and Criteria: Version 3.1*. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

	Endangered	Threatened
B. Small Distribution, and Decline or Fluctuation		
1. Extent of occurrence	< 5,000 km ²	< 20,000 km ²
Or		
2. Area of occupancy	< 500 km ²	< 2,000 km ²
For either of the above, specify at least two of a-c:		
(a) either severely fragmented or known to exist at # locations	≤ 5	≤ 10
(b) continuing decline observed, inferred or projected in one or more of the following:		
	i) extent of occurrence ii) area of occupancy iii) area, extent and/or quality of habitat iv) number of locations or populations v) number of mature individuals	
(c) extreme fluctuations in one or more of the following:	> 1 order of magnitude	> 1 order of magnitude
	i) extent of occurrence ii) area of occupancy iii) number of locations or populations iv) number of mature individuals	

C. Small Total Population Size and Decline

Number of mature individuals	< 2,500	< 10,000
and 1 of the following 2:		
(1) an estimated continuing decline rate of at least:	20% in 5 years or 2 generations whichever is longer (up to a maximum of 100 years in the future)	10% in 10 years or 3 generations whichever is longer (up to a maximum of 100 years in the future)
(2) continuing decline, observed, projected, or inferred, in numbers of mature individuals and at least one of the following (a-b):		
(a) population structure in the form of one of the following:	(i) no population estimated to contain >250 mature individuals (ii) at least 95 % of mature individuals in one population	(i) no population estimated to contain >1,000 mature individuals (ii) all mature individuals are in one population
(b) extreme fluctuations in the number of mature individuals		

D. Very Small Population or Restricted Distribution

- | | | |
|--|--|---------|
| (1) number of mature individuals estimated to be | < 250 | < 1,000 |
| Or | | |
| (2) Applies only to threatened: | Population with a very restricted area of occupancy (area of occupancy typically < 20 km ²) or number of locations (typically 5 or fewer) such that it is prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and thus is capable of becoming highly endangered or even extinct in a very short time period. | |

E. Quantitative Analysis

Indicating the probability of extinction in the wild to be at least:	20% in 20 years or 5 generations, whichever is longer (up to a maximum of 100 years)	10% in 100 years
--	--	------------------

Special Concern:

those species that are particularly sensitive to human activities or natural events but are not endangered or threatened species.

Species may be classified as being of Special Concern if:

- (a) the species has declined to a level of abundance at which its persistence is increasingly threatened by genetic, demographic or environmental stochasticity, but the decline is not sufficient to qualify the species as Threatened; or
- (b) the species is likely to become Threatened if factors suspected of negatively influencing the persistence of the species are neither reversed nor managed with demonstrable effectiveness; or
- (c) the species is near to qualifying, under any criterion, for Threatened status; or
- (d) the species qualifies for Threatened status but there is clear indication of rescue effect from extra-limital populations.

Examples of reasons why a species may qualify for "Special Concern":

- a species that is particularly susceptible to a catastrophic event (e.g., a seabird population near an oil tanker route); or
- a species with very restricted habitat or food requirements for which a threat to that habitat or food supply has been identified (e.g., a bird that forages primarily in old-growth forest, a plant that grows primarily on undisturbed sand dunes, a fish that spawns primarily in estuaries, a snake that feeds primarily on a crayfish whose habitat is threatened by siltation); or
- a recovering species no longer considered to be Threatened or Endangered but not yet clearly secure.

Examples of reasons why a species may not qualify for "Special Concern":

- a species existing at low density in the absence of recognized threat (e.g., a large predatory animal defending a large home range or territory); or
- a species existing at low density that does not qualify for Threatened status for which there is a clear indication of rescue effect.

Guidelines for use of Extinct or Extirpated

A species may be assessed as extinct or extirpated from Canada if:

- there exists no remaining habitat for the species and there have been no records of the species despite recent surveys; or
- 50 years have passed since the last credible record of the species, despite surveys in the interim; or
- there is sufficient information to document that no individuals of the species remain alive.

Guidelines for use of Data Deficient

Data Deficient should be used for cases where the status report has fully investigated all best available information yet that information is insufficient to: a) satisfy any criteria or assign any status, or b) resolve the species' eligibility for assessment.

Examples:

- Records of occurrence are too infrequent or too widespread to make any conclusions about extent of occurrence, population size, threats, or trends.
- Surveys to verify occurrences, when undertaken, have not been sufficiently intensive or extensive or have not been conducted at the appropriate time of the year or under suitable conditions to ensure the reliability of the conclusions drawn from the data gathered.
- The species' occurrence in Canada cannot be confirmed or denied with assurance.

Data Deficient should **not** be used if: a) the choice between two status designations is difficult to resolve by COSEWIC, or b) the status report is inadequate and has not fully investigated all best available information (in which case the report should be rejected), or c) the information available is minimally sufficient to assign status but inadequate for recovery planning or other such use.

Table 3. Guidelines for modifying status assessment based on rescue effect.

COSEWIC's approach to assigning status is, first, to examine the Canadian status of a species or other Designatable Unit in isolation and then, if deemed appropriate, to consider the potential for "rescue" from extra-regional populations (e.g., from across an international boundary or from another Designatable Unit within Canada). The potential for "rescue" is then considered. The rescue effect is the immigration of gametes or individuals that have a high probability of reproducing successfully, such that extirpation or decline of a population, or some other Designatable Unit, can be mitigated. If the potential for rescue is high, the risk of extirpation may be reduced, and the status may be downgraded. COSEWIC addresses this by applying the following guidelines developed by IUCN for this purpose (Gardenfors et al. 1999¹).

Likelihood of propagule migration

Are there any extra-regional populations within a distance from which propagules could reach the region? Are there any effective barriers preventing dispersal to and from extra-regional populations? Is the species capable of long-distance dispersal? Is it known to do so?

If there are no extra-regional populations or propagules are not able to disperse to the region, the regional population behaves as an endemic and the status category should be left unchanged.

Evidence for the existence of local adaptations

Are there any known differences in local adaptation between regional and extra-regional populations, i.e. is it probable that individuals from extra-regional populations are adapted to survive within the region?

If it is unlikely that individuals from extra-regional populations would be able to survive within the region, the status category should be left unchanged.

Availability of suitable habitat

Are current conditions of habitats and/or other environmental (including climatological) requirements of the taxon in the region such that immigrating propagules are able to successfully establish themselves (i.e. are there inhabitable patches), or has the taxon disappeared from the region because conditions were not

If there is not enough suitable habitat and current conservation measures are not leading to an improvement of the habitat within a foreseeable future, immigration from outside the region will not decrease extinction risk and the status category should be left unchanged.

¹ Gardenfors, U., J.P.Rodriguez, C. Hilton-Taylor, C. Hyslop, G. Mace, S. Molur and S. Poss. 1999. *Draft guidelines for the application of Red List criteria at national and regional levels*. Species 31-32:58-70.

favourable?

Status of extra-regional populations

How abundant is the taxon in neighbouring regions? Are the populations there stable, increasing or decreasing? Are there any important threats to those populations? Is it probable that they produce an appreciable amount of emigrants, and will continue to do so for the foreseeable future?

If the taxon is more or less common outside the region and there are no signs of population decline, and if the taxon is capable of dispersing to the region and there is (or soon will be) available habitat, downgrading the category is appropriate. If the population size of extra-regional populations is declining, the 'rescue effect' is less likely to occur, hence downgrading the status category may not be appropriate.

Degree of dependence on extra-regional sources

Are extant regional populations self-sustaining (i.e. have they shown a positive reproductive rate over the years) or are they dependent on immigration for long-term survival (i.e. are the regional populations sinks)?

If there is evidence that a substantial number of propagules regularly reach the region and the population still has a poor survival, the regional population may be a sink. If so, and there are indications that the immigration will soon cease, upgrading the status category may be appropriate.

Table 4: Policy for modifying status assessment based on quantitative criteria

COSEWIC, IUCN and other groups recognize the need for additional assessment tools. Specifically, there is a need to consider life-history variation amongst species and other taxa. COSEWIC has developed the following guideline:

In addition to the quantitative guidelines, COSEWIC will base its assessment on the degree to which various life-history characteristics (e.g., age & size at maturity, dispersal strategy, longevity) affect extinction probability and the likelihood that the species is vulnerable to the Allee effects of density dependence.

All else being equal:

- species with delayed age at maturity tend to be at greater risk of extinction than species with early age at maturity;
- for indeterminately growing organisms (species that continue to grow after attaining maturity), larger species tend to be at greater risk of extinction than smaller species;
- species with low dispersal tend to be at greater risk of extinction than species with high dispersal; and
- species with non-overlapping generations tend to be at greater risk of extinction than species with overlapping generations.

Table 5. COSEWIC status categories.

Extinct (X) - A wildlife species that no longer exists.

Extirpated (XT) - A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.

Endangered (E) - A wildlife species facing imminent extirpation or extinction.

Threatened (T) - A wildlife species likely to become endangered if limiting factors are not reversed.

Special Concern (SC) - A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Data Deficient (DD) - A wildlife species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.

Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

APPENDIX VII

Applications for Species Assessment and Unsolicited Species Status Reports (COSEWIC O&P Manual-Appendix F9)

Approved by COSEWIC in May 2004

Approved by CESSC in September 2004

Modifications Approved by COSEWIC May 2005¹

All of COSEWIC's actions are directed towards assessing the biological status of native wild species suspected of being at risk of extinction or extirpation across their range in Canada. COSEWIC uses the best available information relevant to assessing a species' risk of extinction or extirpation, which it may obtain from credible sources of knowledge of the species and its habitat. The evaluation process is independent and transparent, and the results are reported to the Canadian Endangered Species Conservation Council (CESSC) and the Canadian public. COSEWIC is established under Section 14(1) of the federal Species at Risk Act (SARA) and its assessments form the foundation for the legal List of Species at Risk under that legislation. Sections 21, 22 and 28 of SARA direct that COSEWIC will consider applications for the assessment of species and species status reports accompanied by applications for the assessment of species, subject to regulations. Any such application constitutes a request for assessment.

COSEWIC maintains and continually updates a Candidate List of species for commissioning Status Reports. Before preparing a request for assessment, potential applicants are asked to contact, via the COSEWIC Secretariat, the appropriate COSEWIC Species Specialist Subcommittee (SSC) or, in the case of a species not covered by any of COSEWIC's nine SSCs, the Chair of COSEWIC. Potential applicants will be advised concerning the estimation of threats to the species in question, the imminence of the threats, the species' current standing on COSEWIC's Candidate List for assessment, valuable sources of information, and other advice concerning the preparation of a request for assessment and/or status report.

Requests for Assessment

Scope of Applications

Applications to COSEWIC may consist either of:

- a request to COSEWIC to consider a particular species for assessment, or;
- a request to COSEWIC to consider a particular species for assessment accompanied by Species Status Report that has not been solicited by COSEWIC.

COSEWIC's usual approach to assigning status is, first, to examine a species as a whole. If deemed appropriate in cases where a single status designation for a species is not

¹. Under the section Scope of Applications, in the first paragraph under the first two bullets, the word "usual" was added to the first sentence to better reflect COSEWIC practices regarding Designatable Units. The second paragraph (beginning "In cases where...") was added in for similar reasons.

Under the section Process, the sixth paragraph was expanded to more thoroughly explain the decision making process for emergency assessments.

Under the section Outcomes, bullets were added to explain how a report may be rejected. The last paragraph was modified to clarify communication channels to the applicant.

sufficient to accurately portray probabilities of extinction within the species COSEWIC will examine the status of entities below the level of species, be they subspecies, varieties, or geographically or genetically distinct populations (i.e. Designatable Units).

In cases where particular Designatable Units are strongly suspected of being at risk, or where they are so different in distribution or conservation status that an overall assessment would be of little value, COSEWIC will assess single Designatable Units below the species level.

- *Requests for Assessment* - A Request for Assessment application may propose an eligible species or Designatable Unit for assessment. A request for assessment of a subspecies, variety, or geographically or genetically distinct population must contain a clear explanation of the validity of the Designatable Unit(s).
- *Species Status Reports* - A Species Status Report must normally consider the whole of a species' occurrence within Canada. Should a Species Status Report propose separate status designations for putative Designatable Units within the species in question, the report must contain clear explanations of the validity of the Designatable Units.

Species' Eligibility

To be eligible for assessment, a species must meet certain criteria regarding taxonomic validity, native origin, regularity of occurrence, and dependence on Canadian habitat. COSEWIC normally only considers species and subspecies or varieties that have been established as taxonomically valid. They must be native to Canada, occur regularly in Canada (thus excluding vagrants), and require habitat in Canada for at least one key life history stage. Any case that is an exception to these rules must be justified with supporting information; this should normally be reviewed and agreed to by COSEWIC before a status report is prepared. Ineligible species (for example domestic, feral, or artificially introduced species of animals and plants, or bacteria and viruses which are specifically excluded by SARA) cannot be assessed by COSEWIC.

Imminence of Threat

Species for which the threat of extinction or extirpation is extreme (e.g., greater than 50% probability of loss within 10 years) and for which immediate action is required if the species is to survive may be subject to emergency assessment. If an emergency assessment is requested, a full justification for considering the threat to be extreme must be provided. A status report is not required to accompany a request for an emergency assessment but is recommended. *Applicants who wish to request an emergency assessment are strongly urged to contact COSEWIC and the appropriate SSC Co-Chair beforehand to determine if the emergency assessment is warranted.*

Justification for the Request and Sources of Information

An explication of why the species might be considered to be at risk is required. This should indicate the nature of the particular threats to the species, population and distribution trends of the species, evidence of decline, and other estimations of its status in Canada including General Status of Species in Canada rankings and provincial or territorial rankings, etc. If there is more information than can be contained in three pages of text, a species status report should be prepared. Sources for the information contained in the justification for the request, be they published literature, unpublished reports, personal observations, or the observations of others, must be listed.

Conflict of Interest

Applicants for Species Status Assessment and suppliers of Species Status Reports for COSEWIC must declare any conflicts of interest pertaining to the application for assessment

and its possible outcome (Annex I). Failure to do so may cause applications and reports to be returned unreceived by COSEWIC.

Species Status Reports

A Species Status Report for COSEWIC is a comprehensive, fully documented technical compilation and analysis of the best available information on a species' status in Canada that indicates the threats to that species. A Species Status Report for COSEWIC must conform to the guidelines for preparation of Status Reports.

Waiver of Moral Rights and Permission to use Species Status Report

Authors and owners of Species Status Reports must grant permission to COSEWIC and to Environment Canada to use, edit, reformat, reproduce, modify, distribute, and share the Species Status Report and any subsequent revisions to that Report by the author. Authors furthermore must provide Environment Canada with a waiver of their moral rights to the Species Status Report. A separate waiver is required from each contributing author. The permission to use the Species Status Report and the waiver of moral rights enable COSEWIC and Environment Canada to treat the final COSEWIC Assessment and Status Report as a living document subject to periodic updates as may be required without having to specifically name the author of the original Species Status Report.

Accordingly, legal owners of a Species Status Report must sign a copy of Annex II (Permission To Use Species Status Report) and each author of a report must sign a copy of Annex III (Waiver of Moral Rights). Failure to include signed copies of Annexes II and III with a Species Status Report that accompanies an Application for Assessment may cause the report to be returned unreceived by COSEWIC.

Employees of the Government of Canada who prepare Species Status Reports are not required to tender the permission in Annex II as the report is automatically the property of the Crown. Employees of a province or territory who prepare Species Status Reports may or may not be required to provide Annex II and should contact the COSEWIC Secretariat (cosewic/cosepac@ec.gc.ca). Author(s) who are government employees are, however, still required to sign the waiver in Annex III.

Completeness of Applications

An Application for Assessment that is incomplete cannot be considered by COSEWIC and will be returned. An application must contain:

- A completed application form "Request for Assessment", signed and dated, that includes a justification for why the species may be at risk of extinction
- Annex I (Conflict of Interest), completed and signed separately by all applicants

If the Application also includes a Species Status Report, it must also include:

- A Copy of Annex II (Permission To Use Species Status Report), signed by all copyright owners (ordinarily the authors) with regards to the Status Report
- Copies of Annex III (Waiver of Moral Rights) signed by each of the authors of the Status Report

An Application for Assessment that is complete but is accompanied by a Species Status Report that is not acceptable may be considered by COSEWIC only on its merits as a request for assessment of a particular species.

Submission of Applications

Applications for Assessment should be mailed to:

COSEWIC Secretariat
c/o Canadian Wildlife Service
Environment Canada
Ottawa, Ontario K1A 0H3

attn: the appropriate Species Specialist Subcommittee or the Chair of COSEWIC

(courier address: Vincent Massey Bldg., 4th floor - 351 St. Joseph blvd, Gatineau,
Quebec, J8Y 3Z5)

Process

Applications for Assessment, including Applications that are accompanied by an unsolicited Species Status Report, will initially be considered by the appropriate SSC or, in the case of a species not covered by one of COSEWIC's nine SSCs, an *ad hoc* subcommittee struck by the Chair of COSEWIC.

An Application for Assessment that is not accompanied by a Species Status Report may be forwarded to COSEWIC by the SSC or *ad hoc* subcommittee with a recommendation and may be received by COSEWIC for consideration at a Species Assessment Meeting. If accepted, the application will be referred to the COSEWIC Co-chairs subcommittee for placement on the COSEWIC Candidate List and assigned a priority level for commissioning a Status Report.

A Species Status Report that accompanies an Application for Assessment is first evaluated by the appropriate SSC or *ad hoc* subcommittee. A Status Report that is complete and in conformity to the guidelines for completion of Status Reports, as judged by the SSC or *ad hoc* subcommittee, will be subjected to review in compliance with normal COSEWIC procedure for all status reports. A valid Status Report will be forwarded to the relevant jurisdictions (including, as necessary, any relevant Wildlife Management Boards) and the COSEWIC ATK Subcommittee for review during the draft and interim report stages. The report will be distributed to all members of COSEWIC two months prior to a Species Assessment Meeting accompanied by a copy of the Application, a Technical Summary prepared by the SSC or *ad hoc* subcommittee, and a recommendation from the SSC or *ad hoc* subcommittee. Throughout this review process, the author(s) of a Species Status Report may be asked to make editorial changes, add available information, and/or delete inapplicable sections of the report. Failure to comply with such requests may result in a report being deemed unacceptable.

The application and report will only be received for consideration by COSEWIC at a Species Assessment Meeting.

An Application for Assessment that is complete but is accompanied by an unsolicited Species Status Report that is incomplete or not in conformity to the guidelines for completion of status reports as judged by the SSC or *ad hoc* subcommittee, or is unaccompanied by a waiver of moral rights and a grant of permission to use the Species Status Report may be considered by COSEWIC as though only a Request for Assessment without a status report. In this case, the Species Status Report will be returned unreceived by COSEWIC. The Applicant will have the option either to proceed with the Request for Assessment without the Status Report or withdraw the Application in order to revise the report.

An Application for Assessment that requests an emergency assessment is first examined by COSEWIC through a subcommittee consisting of the Chair of COSEWIC and others including the appropriate SSC, and COSEWIC members from the appropriate range jurisdictions. If there is unanimous agreement that there is insufficient evidence that emergency conditions exist or that the Application is otherwise unsuitable, then the application is declined. If the application is acceptable, the Chair notifies the Federal Minister of Environment, CESC, and COSEWIC members that an emergency assessment is being undertaken. The Chair then establishes an *ad hoc* Emergency Assessment Subcommittee consisting of the Chair of COSEWIC, the appropriate Subcommittee Co-chair(s), the relevant jurisdictional member(s) of COSEWIC, and other member(s) of COSEWIC at the Chair's discretion. Representatives from relevant Wildlife Management Boards may sit on the subcommittee as non-voting members. The Emergency Assessment Subcommittee will consider the imminence of the threats to the species and whether a status listing on an emergency basis is warranted. If the emergency listing is warranted, the Emergency Assessment Subcommittee will forward its recommendation

to the federal Minister of Environment and advise COSEWIC. If the emergency listing is not warranted, the Application will be considered in the same manner as a regular request for assessment.

Outcomes

1. An Application for Assessment that is not accompanied by a Species Status Report or is accompanied by a Species Status Report that has been rejected (see 2 below) will either:
 - be accepted by COSEWIC and result in the species in question being placed on the Candidate List and assigned a priority level for commissioning a Species Status Report. Priority level will be determined by COSEWIC on advice from the appropriate SSC or *ad hoc* subcommittee, or;
 - be accepted by COSEWIC and result in the species in question being assigned a new level of priority for commissioning a species status report, or;
 - be rejected by COSEWIC either:
 - through a subcommittee of COSEWIC consisting of the Chair of COSEWIC and the members of the appropriate SSC following unanimous agreement that the application is unsuitable, or;
 - at a Species Assessment Meeting.
2. An unsolicited Species Status Report that accompanies an Application for Assessment will either:
 - be accepted by COSEWIC and result in the species in question being assessed by COSEWIC at a Species Assessment Meeting, or;
 - be rejected by COSEWIC either:
 - through a subcommittee of COSEWIC consisting of the Chair of COSEWIC and the members of the appropriate SSC following unanimous agreement that the application is unsuitable, or;
 - at a Species Assessment Meeting.
3. An Application for Assessment that requests an emergency assessment may either:
 - be rejected by COSEWIC through a subcommittee of COSEWIC consisting of the Chair of COSEWIC and others including members of the appropriate SSC and COSEWIC members from the appropriate range jurisdictions, following unanimous agreement that the application is unsuitable, or;
 - be accepted by the *ad hoc* Emergency Assessment Subcommittee and forwarded to the Minister of Environment with a recommendation, or;
 - be rejected by the *ad hoc* Emergency Assessment Subcommittee and considered in the same terms as any other request for assessment.

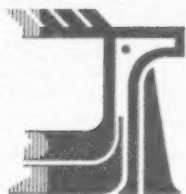
Applicants will be informed of the decision(s) made through the Chair of COSEWIC. For Applications resulting in an assessment or emergency assessment, COSEWIC will notify the applicant of the assessment and the reasons. For all rejected Applications, the reason for the rejection will be given. In these matters, the decision(s) as communicated by the Chair will be final for any particular Application.

Additional Information on the COSEWIC Website (<http://www.cosewic.gc.ca/index.htm>):

- Assessment Process and Criteria
http://www.cosewic.gc.ca/pdf/English/Assessment_process_e.pdf
- Guidelines for Recognizing Designatable Units Below the Species Level
http://www.cosewic.gc.ca/eng/sct2/sct2_5_e.cfm
- Instructions for the Preparation of COSEWIC Status Reports
<http://www.cosewic.gc.ca/pdf/English/Instructions.pdf>

Attachments:

- Application Form "Request for Assessment" (Required for all applications)
- Annex I: Declaration of Conflict of Interest (Required for all applications)
- Annex II: Permission To Use Species Status Report (To accompany status reports only)
- Annex III: Waiver of Moral Rights (To accompany status reports only)



COSEWIC

Request for Species Assessment

Date of Application: _____

Name(s) of applicant(s):

Address:

telephone, fax, email:

Status report: attached ☐ not attached ☐

Species (Scientific name, English and French common names):

Species' Distribution

Globally:

In Canada:

Imminence of Threat:

extreme ☐ very high ☐ high ☐ moderate ☐ not known ☐ not applicable ☐

Is the threat of extinction or extirpation from Canada sufficiently grave

as to warrant an emergency assessment? yes ☐ no ☐

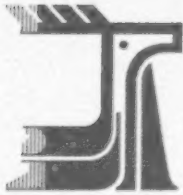
Justification for Request for Assessment (maximum 3 pages)

(i.e. evidence of decline, threats to the species, other reasons to suspect the species is at risk of extinction or extirpation from Canada)

Sources of Information:

The applicant(s) attest that the information in this request for assessment is, to the greatest extent possible, accurate and true. Furthermore, if a Species Status Report is attached, the author(s) agree(s) that the status report may be reviewed and edited by COSEWIC and the corresponding Subcommittee Co-Chair, that the author(s) will receive no royalty or other compensation from the Government of Canada or from COSEWIC, and that the manuscript contains no matter that is libellous, invades individual privacy, or infringes upon any proprietary rights.

Signature(s): _____



Annex I

Declaration of Conflict of Interest
To accompany all applications

A separate copy of this form must be completed by each applicant.

Pursuant to the Request for Assessment of:

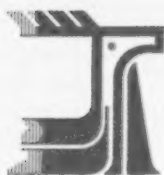
(species) _____,

I, (name) _____, hereby declare any and all proprietary or commercial interest or conflicts of interest I may have that relate directly or indirectly to the subject of this application.

Details:

Signature _____

Date: _____



Annex II

Permission To Use Species Status Report
To accompany submission of a status report

I/We _____ as legal owner(s)
name(s)

of the intellectual property in the Species Status Report entitled

(Update) Status report on the _____ in Canada
name of species

hereby grant permission to COSEWIC and to Environment Canada (EC) to use, edit, reformat, reproduce, modify, distribute, and share the Species Status Report, a copy of which is attached to this Permission, in whole or in part, in support of the COSEWIC species status assessment process.

I/we understand that EC will be using the Species Status Report to produce a COSEWIC Assessment and Status Report and future updates to this latter report. I/we also understand and agree the COSEWIC Assessment and Status Report and future updates shall be the intellectual property of EC and that I/we have no rights to them.

I am/we are submitting, with this Permission, waivers of Moral Rights from all authors who contributed to the Species Status Report.

Signature _____

Name _____

Address _____

Signature _____

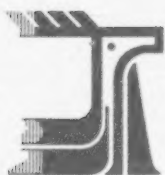
Name _____

Address _____

Signature _____

Name _____

Address _____



Annex III

Waiver of Moral Rights
To accompany submission of a status report

A separate copy of this form must be completed by each author.

I _____ declare that I
name of author

have contributed to the creation or production of the Species Status Report entitled:

(Update) Status report on the _____ **in Canada**
name of species

(hereinafter referred to as the "Work") and briefly described as a report containing the best available information on the species status in Canada that will form the basis for a status assessment by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).
I recognize that:

name(s) of copy right owner(s)

is/are the lawful owner(s) of the copyright in the Work.

I am are fully aware that my moral rights, as defined by the Copyright Act, include a) the right of having my name associated with the Work, where reasonable in the circumstances; and b) the right to the integrity of the Work such as preventing the Work from being changed, corrected or amended.

I hereby waive in whole all moral rights which I may have in the Work in favour of the Government of Canada (Environment Canada), including the right to the integrity of the Work, the right to be associated with the Work in all contexts and in connection with all products and/or services.

For purposes of this Waiver, "Work" shall include without limitation all multimedia presentations, software, documentation, data, designs, reports, flowcharts, specification and source code listings, and of any related works, including any enhancements, modifications, or additions to the software and hardware products owned, marketed, or used by the Government of Canada.

Signed, sealed and delivered in the presence of

Witness (signature)

Author (signature)

Name of Witness (printed)

Name of Author (printed)

Date

APPENDIX VIII

COSEWIC Status Assessments (November 2004 /May 2005)*

Results are grouped by taxon and then by status category. A reason for designation is given for each species. A short history of status designations follows. The range of occurrence in Canada for each species (by province, territory, or ocean) is provided.

* The following detailed COSEWIC Status Assessment Results do not include the Emergency Assessment of the Chinook Salmon, Okanagan population, as this information has already been provided to you on May 5, 2005

November 2004 results

Mammals

North Pacific Right Whale
Assessment Criteria A1d; D1

Eubalaena japonica

Endangered

Reason for Designation

Although there have not been sightings of this species in the last 50 years in Canadian waters, there have been sightings both south and north of British Columbia waters. Therefore it is not appropriate to classify the species as extirpated. The total population in the eastern North Pacific likely numbers a few tens of animals.

Range Pacific Ocean

Status History

The Right Whale was considered a single species and designated Endangered in 1980. Status re-examined and confirmed in April 1985 and in April 1990. Split into two species in May 2003. North Pacific Right Whale was not re-evaluated in May 2003; it retained the Endangered status of the original Right Whale. Status re-examined and confirmed Endangered in November 2004.

Narwhal

Monodon monceros

Special Concern

Assessment Criteria not applicable

Reason for Designation

The Baffin Bay population appears to be large (~45,000), although there is uncertainty about numbers, trends, life history parameters, and levels of sustainable hunting. There is similar uncertainty about the much smaller Hudson Bay population (~2,100 mature individuals). Hunting for *maktak* and the commercially valuable tusk ivory represents the most consistent threat to narwhals. Potential effects of changes in ice coverage caused by climate trends are unknown. The Hudson Bay population could decline by 30% in 30 years if hunting is not closely regulated. Similarly, the Baffin Bay population could be affected if hunting in Greenland is not effectively managed. Numbers removed by hunting increased during the 1990s. Community-based management is monitoring hunting and is attempting to regulate removals. Reliable information about numbers that are killed and not recovered is difficult to obtain.

Range Arctic Ocean

Status History

Designated Not at Risk in April 1986 and in April 1987. Status re-examined and designated Special Concern in November 2004.

Birds

Ancient Murrelet

Synthliboramphus antiquus

Special Concern

Assessment Criteria not applicable

Reason for Designation

This burrow-nesting seabird is impacted by mammalian predators that have been introduced to its breeding islands. Predators have been removed from some islands but populations have not increased as a result. About half of the world population nests in the Queen Charlotte Islands, British Columbia; the Canadian population is thought to be declining.

Range BC

Status History

Designated Special Concern in April 1993. Status re-examined and confirmed in November 2004.

Reptiles

Eastern Yellow-bellied Racer *Coluber constrictor flaviventris*

Threatened

Assessment Criteria Met criteria for Endangered, B1ab(iii)+2ab(iii), but designated Threatened, B1ab(iii)+2ab(iii), because a large part of the subspecies' habitat is in Grasslands National Park, and there is rescue potential from the state of Montana.

Reason for Designation

This snake is restricted to two small areas in extreme southern Saskatchewan. It is at risk due to loss of habitat from agriculture, mortality on roads, loss of den sites and perhaps from effects of small population size. There may be a rescue effect from immigration from the United States, but this effect has not been observed.

Range SK

Status History

Designated Special Concern in April 1991. Status re-examined and designated Threatened in November 2004.

Western Yellow-bellied Racer *Coluber constrictor mormon*

Special Concern

Assessment Criteria not applicable

Reason for Designation

This snake occurs in five valleys in south-central British Columbia. It is susceptible to habitat loss and fragmentation from agriculture and urban development, especially as this species is particularly intolerant of urbanization. The ongoing expansion of the road network and traffic volumes increases mortality and further fragments the habitat. Pesticide applications in agricultural areas may impact the snakes both directly and via contamination of their insect prey. It is unlikely that there is a significant rescue effect because of extensive loss of habitat contiguous to the United States border.

Range BC

Status History

Designated Not at Risk in April 1991. Status re-examined and designated Special Concern in November 2004.

Amphibians

Red-legged Frog

Rana aurora

Special Concern

Assessment Criteria not applicable

Reason for Designation

A large proportion of the known Canadian distribution of this species occurs in the densely populated southwestern part of British Columbia. Habitats are becoming increasingly lost and fragmented due to land conversions and other human activities. Introduced Bullfrog and Green Frog, which are spreading rapidly, have replaced this species at many sites and appear to adversely affect the use of wetland breeding sites and reproductive success. Populations of this species, and other amphibian species that require extensive habitat, are inherently vulnerable to habitat fragmentation which can be expected to exacerbate isolation effects and local extinctions.

Range BC

Status History

Designated Special Concern in April 1999. Status re-examined and confirmed in May 2002 and in November 2004.

Fishes

Striped Bass

Morone saxatilis

Extirpated

St. Lawrence Estuary population

Assessment Criteria not applicable

Reason for Designation

The population from the St. Lawrence Estuary has disappeared as a consequence of illegal fishing, with the last record dating from 1968.

Range QC

Status History

Designated Extirpated in November 2004.

Copper Redhorse

Moxostoma hubbsi

Endangered

Assessment Criteria A2c; B1ab(v)+2ab(v)

Reason for Designation

This species is endemic to Canada where it is now known from only three locations in southwestern Quebec that possibly represent a single population. The distribution and abundance of the species have been severely reduced due to a number of anthropogenic factors (e.g., urban development, agricultural practices, and the construction of dams) that have contributed to a decrease in water quality and habitat availability. The recent introduction of exotic species such as zebra mussel may further impact habitat quality.

Range QC

Status History

Designated Threatened in April 1987. Status re-examined and designated Endangered in November 2004.

Striped Bass

Morone saxatilis

Threatened

Southern Gulf of St. Lawrence population

Assessment Criteria Met criteria for Endangered, B2ac(iv), but designated as Threatened, B2ac(iv); D2, because of the high degree of resilience evident in recent spawner abundance estimates.

Reason for Designation

This fish was once commercially important and is still highly prized by anglers. Threats include bycatch in various fisheries such as gaspereau, and rainbow smelt. Illegal take, particularly during ice fishing, is also believed to be a threat.

Range QC NB PE NS

Status History

Designated Threatened in November 2004.

Striped Bass

Morone saxatilis

Threatened

Bay of Fundy population

Assessment Criteria Met criteria for Endangered, A2bc, but designated Threatened, A2bc; D2, because the one remaining spawning population does not appear to be at imminent risk.

Reason for Designation

Repeated spawning failures led to the disappearance of the Annapolis and Saint John River populations. These disappearances are thought to be due to changes in flow regime and poor water quality. In the Shubenacadie River population, the presence of the introduced chain pickerel in overwintering sites may constitute a threat. Another threat to the population is bycatch from various commercial fisheries. The Bay of Fundy is also used by striped bass breeding in rivers in the United States. These fish were not assessed.

Range NB NS

Status History

Designated Threatened in November 2004.

Bering Cisco

Coregonus laurettae

Special Concern

Assessment Criteria not applicable

Reason for Designation

This is an anadromous species that depends on barrier-free access to upstream spawning sites. In Canada, it is known only from the Yukon River. The numbers utilizing Canadian portions of the Yukon River are low compared to lower sections of the river in United States parts of the range and could be negatively impacted by hydroelectric development and expansion of commercial or subsistence fisheries, targeting other species in the river.

Range YT

Status History

Species considered in April 1990 and placed in the Data Deficient category. Re-examined in November 2004 and designated Special Concern.

Green Sturgeon

Acipenser medirostris

Special Concern

Assessment Criteria not applicable

Reason for Designation

The number of individuals in Canadian waters is unknown, but is undoubtedly not large. This species is globally at risk and is of concern in Canada because of exploitation and habitat loss due to damming of rivers.

Range BC

Status History

Designated Special Concern in April 1987. Status re-examined and confirmed in November 2004.

Lake Chub

Couesius plumbeus

Data Deficient

Northern British Columbia Hotsprings populations

Assessment Criteria not applicable

Reason for Designation

Although there is inconclusive evidence for reproductive isolation of the hotsprings populations from the parent form, the best available information is insufficient to resolve the species' eligibility for

assessment.

Range BC

Status History

Species considered in November 2004 and placed in the Data Deficient category.

Pygmy Longfin Smelt

Spirinchus sp.

Data Deficient

Assessment Criteria not applicable

Reason for Designation

Although there is equivocal evidence of reproductive isolation of normal and pygmy populations, the best available information is insufficient to resolve the species' eligibility for assessment.

Range BC

Status History

Species considered in November 2004 and placed in the Data Deficient category.

Vascular Plants

American Chestnut

Castanea dentata

Endangered

Assessment Criteria A4ace; B2ab(ii,iii,iv,v); C2a(i); D1

Reason for Designation

Once a dominant tree in well drained forests of the Eastern Deciduous Forest, this species was devastated by chestnut blight in the first part of the 20th century. The species is still present throughout most of its former range, but as a few scattered individuals that have sprouted from root crowns. Most of these succumb to the blight before reaching a substantial size and fewer than 150 are large enough to produce seed. The species requires cross-pollination and seed set is reduced because mature individuals are widely scattered. Threats to the species include the continuous presence of the blight, aging and attrition of the root crowns, land clearing in some remaining sites, and hybridization with other species.

Range ON

Status History

Designated Threatened in April 1987. Status re-examined and designated Endangered in November 2004.

Dwarf Lake Iris

Iris lacustris

Threatened

Assessment Criteria D2

Reason for Designation

This is a globally rare Great Lakes endemic plant, restricted in Canada to semi-shaded calcareous areas of Ontario's Bruce Peninsula and Manitoulin Island. It is currently known from about 40 Canadian sites and faces habitat loss and degradation at some sites. Several sites have been lost to development. Two of the largest populations are protected in a national and a provincial park.

Range ON

Status History

Designated Threatened in November 2004.

Hill's Thistle

Cirsium hillii

Threatened

Assessment Criteria Met criterion for Endangered, C2a(i), but designated Threatened, C2a(i); D1, because the species is not at imminent risk of extirpation due to the occurrence of numerous sites, some in protected areas.

Reason for Designation

This is a perennial herb restricted to the northern midwestern states and adjacent Great Lakes that is found in open habitats on shallow soils over limestone bedrock. In Ontario, it is found at 64 extant sites but in relatively low numbers of mature flowering plants that are estimated to consist of fewer than 500 individuals. Some populations are protected in national and provincial parks, however, the largest population is at risk from aggregate extraction. On-going risks are present from shoreline development, ATV use, and successional processes resulting from fire suppression within its habitat.

Range ON

Status History

Designated Threatened in November 2004.

Macoun's Meadowfoam

Limnanthes macounii

Threatened

Assessment Criteria Met criteria for Endangered, B1ab(iii)+2ab(iii), but designated Threatened, B1ab(iii)+2ab(iii); D2, because the species does not seem to be at imminent risk of extirpation.

Reason for Designation

A Canadian endemic highly restricted within a narrow coastal fringe of seasonally wet microhabitats where it is at risk from continued competition with a wide range of exotic plants. Its presence in a highly urbanized area results in habitat disruption and population losses.

Range BC

Status History

Designated Special Concern in April 1988. Status re-examined and designated Threatened in November 2004.

Showy Phlox

***Phlox speciosa* ssp.
*occidentalis***

Threatened

Assessment Criteria B1ab(ii,iii,v)+B2ab(ii,iii,v); D2

Reason for Designation

A showy perennial known from a very small area and from fewer than 10 locations. The species is present within a region subject to on-going habitat loss and degradation as a consequence of private property development, agricultural practices, and the spread of invasive plants.

Range BC

Status History

Designated Threatened in November 2004.

Swamp Rose-mallow

Hibiscus moscheutos

Special Concern

Assessment Criteria Met criterion for Threatened, D2, but designated Special Concern because it is relatively widespread, found in protected areas, and there is potential for rescue effect.

Reason for Designation

A robust, perennial herb of shoreline marshes of the Great Lakes present in Ontario at many localities, in very small areas, and generally in low numbers. The total Canadian population is estimated to consist of fewer than 10,000 plants with some, including two of the largest populations, in protected sites. The species has been subjected historically to habitat loss and several populations have been lost recently. Populations are also at risk from habitat degradation and impact due especially to invasive exotic plants. Evidence of the spread of plants through rafting of floating clumps indicates that recolonization of extirpated sites may be possible.

Range ON

Status History

Designated Special Concern in April 1987. Status re-examined and confirmed in November 2004.

Mosses

Rusty Cord-moss

Entosthodon rubiginosus

Endangered

Assessment Criteria B2ab(iii); C2a(i); D1

Reason for Designation

This species is endemic to western North America where it occurs in southern British Columbia, and has been reported from Montana, Arizona, and New Mexico. This moss has a highly restricted distribution in south-central British Columbia where only four populations have been found. Of these, three populations are extant, and one was not relocated; the species is not abundant at any known site. The species' habitat is a narrow band of shoreline dominated by grasses and other mosses in seasonally wet, alkaline habitats. Two populations have been affected by trampling by horses or cattle, and all sites examined have been impacted to varying degrees by domestic animals. At least a portion of one population has been lost as result of trampling by domestic animals.

Range BC

Status History

Designated Endangered in November 2004.

Alkaline Wing-nerved Moss

Pterygoneurum kozlovii

Threatened

Assessment Criteria Met criteria for Endangered, B2ab(iii,iv), but designated Threatened, B2ab(iii,iv), because the species is known from several locations over a wide area, and not thought to be at imminent risk of extirpation.

Reason for Designation

This species, restricted in North America to western Canada, is globally imperiled or rare. Canada possesses the great majority of documented locations. The species typically grows on soil among grasses and sedges along the margins of alkaline ponds and sloughs in semi-arid regions of Canada. It has been confirmed at only 13 sites from 24 reported in south central British Columbia. There is one unconfirmed site in Saskatchewan. About half of all the known sites are subject to impacts from people and domestic animals. Of the British Columbia sites, 6 have apparently been lost to urban development, highway improvement, and trampling by cattle, implying that decline in habitat quality and extent are presently impacting the species.

Range BC SK

Status History

Designated Threatened in November 2004.

May 2005 Results

Results are grouped by taxon and then by status category. A reason for designation is given for each species. A short history of status designations follows. The range of occurrence in Canada for each species (by province, territory, or ocean) is provided.

Mammals

Bowhead Whale

Balaena mysticetus

Threatened

Hudson Bay-Foxe Basin population

Assessment Criteria D1

Reason for Designation

The population was severely reduced by commercial whaling between 1860 and 1915. Recent population estimates are uncertain, but indicate that there could be as few as 300 mature individuals, of which only half might be females. Threats to this small population include illegal hunting and increased vulnerability to killer

whale predation as a result of reduced ice coverage.

Range Arctic Ocean

Status History

The "Eastern and Western Arctic populations" were given a single designation of Endangered in April 1980. Split into two populations (Eastern Arctic and Western Arctic) to allow separate designations in April 1986. The Eastern Arctic population was not re-evaluated in April 1986, but retained the Endangered status of the original "Eastern and Western Arctic populations". The Eastern Arctic population was further split into two populations (Hudson Bay-Foxe Basin population and Davis Strait-Baffin Bay population) in May 2005, and the Hudson Bay-Foxe Basin population was designated Threatened.

Bowhead Whale

Balaena mysticetus

Threatened

Davis Strait-Baffin Bay population

Assessment Criteria Meets criterion for Endangered, A1b, but assessed as Threatened, A1b, because commercial whaling -- the primary cause of the population reduction -- has ceased.

Reason for Designation

The population numbered at least 11,000 animals when commercial whaling began. Whaling reduced the population to less than 30% of its former abundance. Recent estimates indicate that the population is growing and is larger than previously thought, but is likely to still number fewer than 3,000 individuals of all ages. The population qualifies for endangered, but is not judged to be in imminent danger of extinction. Threats include illegal hunting and increased vulnerability to killer whale predation as a result of reduced ice coverage.

Range Arctic Ocean

Status History

The "Eastern and Western Arctic populations" were given a single designation of Endangered in April 1980. Split into two populations (Eastern Arctic and Western Arctic) to allow separate designations in April 1986. The Eastern Arctic population was not re-evaluated in April 1986, but retained the Endangered status of the original "Eastern and Western Arctic populations". The Eastern Arctic population was further split into two populations (Hudson Bay-Foxe Basin population and Davis Strait-Baffin Bay population) in May 2005, and the Davis Strait-Baffin Bay population was designated Threatened.

Fin Whale***Balaenoptera physalus*****Threatened****Pacific population**Assessment Criteria A1dReason for Designation

Currently sighted only infrequently on former whaling grounds off British Columbia. Coastal whaling took at least 7,600 animals from the population between 1905 and 1967, and thousands of additional animals were taken by pelagic whalers through the 1970s. Catch rates from coastal whaling stations declined precipitously off British Columbia in the 1960s. Based on the severe depletion and lack of sufficient time for recovery, it is inferred that present population is below 50% of its level, 60-90 years ago. Individuals continue to be at risk from ship strikes and entanglement in fishing gear.

Range Pacific OceanStatus History

The species was considered a single unit and designated Special Concern in April 1987. Split into two populations (Atlantic and Pacific) in May 2005. The Pacific population was designated Threatened in May 2005.

Bowhead Whale***Balaena mysticetus*****Special Concern****Bering-Chukchi-Beaufort population**Assessment Criteria not applicableReason for Designation

This population was hunted to low levels during commercial whaling. Although supporting a regulated hunt, it is recovering and is currently at about 50% of its historical population size. The population is not yet secure and is potentially negatively affected by climate change, and by oil and gas development.

Range Arctic OceanStatus History

The "Eastern and Western Arctic populations" were given a single designation of Endangered in April 1980. Split into two populations (Eastern Arctic and Western Arctic) to allow separate designations in April 1986. The Western Arctic population was designated Endangered in April 1986. The population was renamed to "Bering-Chukchi-Beaufort population" and designated Special Concern in May 2005.

Fin Whale***Balaenoptera physalus*****Special Concern****Atlantic population**Assessment Criteria not applicableReason for Designation

The size of this population was reduced by whaling during much of the 20th Century. However, sightings remain relatively common off Atlantic Canada and they have not been hunted since 1971. The current abundance and level of depletion compared with pre-whaling numbers are uncertain. The whales face a number of current threats including ship strikes and entanglement in fishing gear, but none is believed to seriously threaten the population.

Range Atlantic OceanStatus History

The species was considered a single unit and designated Special Concern in April 1987. Split into two populations (Atlantic and Pacific) in May 2005. The Atlantic population was designated Special Concern in May 2005.

Birds

Williamson's Sapsucker
Assessment Criteria A4c; C1

Sphyrapicus thyroideus

Endangered

Reason for Designation

This woodpecker is associated with mature larch forests in south-central British Columbia; less than 500 individuals breed in Canada. Habitat loss through forest harvest is estimated to have been 23% over the last 10 years and is projected to be about 53% over the next decade.

Range BC

Status History

Designated Endangered in May 2005.

Reptiles

Blanding's Turtle
Nova Scotia population

Emydoidea blandingii

Endangered

Assessment Criteria B1ab(iii,v)+2ab(iii,v); C2a(i); D1

Reason for Designation

The three small subpopulations of this species found in central southwest Nova Scotia total fewer than 250 mature individuals. These three subpopulations are genetically distinct from each other and from other Blanding's Turtles in Quebec, Ontario and the United States. Although the largest subpopulation occurs in a protected area, its numbers are still declining. The other subpopulations are also susceptible to increasing habitat degradation, mortality of adults and predation on eggs and hatchlings.

Range NS

Status History

Designated Threatened in April 1993. Status re-examined and designated Endangered in May 2005.

Blanding's Turtle
Great Lakes/St. Lawrence population

Emydoidea blandingii

Threatened

Assessment Criteria C2a(i)

Reason for Designation

The Great Lakes/St. Lawrence population of this species although widespread and fairly numerous is declining. Subpopulations are increasingly fragmented by the extensive road network that crisscrosses all of this turtle's habitat. Having delayed age at maturity, low reproductive output and extreme longevity makes this turtle highly vulnerable to increased rates of mortality of adults. Nesting females are especially susceptible to roadkill because they often attempt to nest on gravel roads or on shoulders of paved roads. Loss of mature females in such a long-lived species greatly reduces recruitment and long-term viability of subpopulations. Another threat is degradation of habitat from development and alteration of wetlands. The pet trade is another serious ongoing threat because nesting females are most vulnerable to collection.

Range ON QC

Status History

Designated Threatened in May 2005.

Fishes

Lake Ontario Kiyi

Coregonus kiyi orientalis

Extinct

Assessment Criteria not applicable

Reason for Designation

Last recorded from Lake Ontario in 1964, the subspecies was driven to extinction by commercial exploitation, and predation/competition by introduced species.

Range ON

Status History

The species was designated Special Concern in April 1988. Split into two subspecies (Upper Great Lakes Kiyi and Lake Ontario Kiyi) in May 2005. The Lake Ontario Kiyi was designated Extinct.

Lake Sturgeon

Acipenser fulvescens

Endangered

Western populations

Assessment Criteria A2b

Reason for Designation

The Western Canadian populations of this species have experienced an overall decline estimated to be at least 77% in the latter decades of the 20th century due to exploitation, and habitat loss and degradation related to dams, impoundments and changes in patterns of water use.

Range AB SK MB

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Western populations" unit was designated Endangered.

Shortnose Cisco

Coregonus reighardi

Endangered

Assessment Criteria D1

Reason for Designation

Endemic to three of the Great Lakes, this species was last recorded in Lake Michigan in 1982, in Lake Huron in 1985, and in Lake Ontario in 1964. Although it has probably disappeared throughout its range, searches for this species have not been extensive enough to declare this species extinct. The species' apparent demise is suspected to be the result of commercial overfishing and possibly competition or predation from introduced species.

Range ON

Status History

Designated Threatened in April 1987. Status re-examined and designated Endangered in May 2005.

Winter Skate*Leucoraja ocellata***Endangered****Southern Gulf population**Assessment Criteria A4bReason for Designation

The species possesses life history characteristics that increase vulnerability to exploitation, that reduce rate of recovery, and that increase the risk of extinction. These characteristics include delayed age at maturity, long generation time, low fecundity, and consequently slow population growth rate. Narrow latitudinal ranges and a high degree of endemism have been documented for the skate family worldwide. This population appears to have a restricted distribution, based on distributional maps of fisheries-independent survey catches. Individuals from this population mature at a significantly smaller size than those found elsewhere in Canadian waters. Abundance of mature individuals in the Southern Gulf of St. Lawrence is estimated to have declined 98% since the early 1970s, and is now at a historically low level. The probable cause of decline is an unsustainable rate at which they were captured as bycatch in fisheries directed at other groundfish species.

Range Atlantic OceanStatus History

Designated Endangered in May 2005.

"Eastslope" Sculpin*Cottus sp.***Threatened****St. Mary and Milk River populations**Assessment Criteria D2Reason for Designation

This species has a very restricted area of occurrence in the St. Mary and Milk rivers in Canada where it has been impacted by habitat loss and degradation from water diversion, conditions that have been exacerbated in recent years by drought.

Range ABStatus History

Designated Threatened in May 2005.

Black Redhorse*Moxostoma duquesnei***Threatened**Assessment Criteria D2Reason for Designation

A freshwater fish with a very small, highly fragmented distribution and area of occupancy, as well as restricted spawning habitat preferences. Native populations are found in only 5 Ontario watersheds in areas heavily impacted by urbanization and agriculture. It is at risk of habitat loss and degradation as a result of increased siltation and turbidity. Dams may adversely affect flow regimes and have fragmented populations in the two major rivers where this species occurs.

Range ONStatus History

Designated Threatened in April 1988. Status re-examined and confirmed in May 2005.

Spotted Gar*Lepisosteus oculatus***Threatened**Assessment Criteria D2Reason for Designation

This species has a very limited range in Canada where it is only known from three coastal wetlands in Lake Erie. Although its distribution is likely limited by temperature, some of the shallow vegetated habitats that it requires for all life stages are subject to the impacts of siltation, dredging, filling, and aquatic vegetation removal and harbour improvements.

Range ONStatus History

Designated Special Concern in April 1983. Status re-examined and confirmed in April 1994. Status re-examined and designated Threatened in November 2000, and in May 2005.

Westslope Cutthroat Trout*Oncorhynchus clarkii lewisi***Threatened****Alberta population**Assessment Criteria A4eReason for Designation

This assessment only considered the remaining genetically pure populations within the native range in Alberta. Such populations have become severely isolated and depressed as a result of habitat loss and degradation, exploitation and especially hybridization with introduced species. The rate of hybridization indicates that this population could be at greater risk, however there was not enough information available at the time of the assessment.

Range ABStatus History

Designated Threatened in May 2005.

Winter Skate*Leucoraja ocellata***Threatened****Eastern Scotian Shelf population**

Assessment Criteria Met criterion for Endangered, A4b, but designated Threatened because the population is not at imminent risk of extirpation.

Reason for Designation

The species possesses life history characteristics that increase vulnerability to exploitation, that reduce rate of recovery, and that increase the risk of extinction. These characteristics include delayed age at maturity, long generation time, low fecundity, and consequently slow population growth rate. Narrow latitudinal ranges and a high degree of endemism have been documented for the skate family worldwide. This population appears to have a restricted distribution, based on distributional maps of fisheries-independent survey catches. Individuals from this population mature at a significantly larger size than those in the Southern Gulf and have been reported to mature at a significantly different age than those inhabiting waters further south. Abundance of mature individuals on the Eastern Scotian Shelf is estimated to have declined by more than 90% since the early 1970s and is now at a historically low level. The area occupied by the population appears to have declined significantly since the mid 1980s. Larger, older individuals have been severely depleted from this population, producing a significant truncation in the length distribution of the population over time. The probable cause of the decline is an unsustainable rate at which they were captured as bycatch in fisheries directed at other groundfish species. They have been caught, and continue to be caught, in a directed fishery for skate, although current reported catches are low.

Range Atlantic OceanStatus History

Designated Threatened in May 2005.

Grass Pickerel*Esox americanus vermiculatus***Special Concern**

Assessment Criteria Met criterion for Threatened, B2ab(ii,v), but designated Special Concern because there is a rescue effect and the species is not likely to become Endangered or Extirpated in the near future.

Reason for Designation

A subspecies known from 10 locations between Lake St. Louis, Quebec and Lake Huron, Ontario. Its usual habitat is shallow water with abundance of aquatic vegetation. An overall decline of approximately 22% in the area of occupancy has been observed. This decline appears to be related to degradation and loss of habitat due to channelization and dredging operations in wetland habitats where this species occurs.

Range ON QCStatus History

Designated Special Concern in May 2005.

Lake Sturgeon***Acipenser fulvescens*****Special Concern****Southern Hudson Bay and James Bay populations**

Assessment Criteria not applicable

Reason for Designation

There are limited population data available for this designatable unit. There have been declines in habitat, and possibly populations decline related to exploitation and the multitude of dams. The increased access to relatively unimpacted populations, and the likelihood of increased hydroelectric development in some areas are causes for concern for this designatable unit.

Range MB ON QC

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Southern Hudson Bay and James Bay populations" unit was designated Special Concern.

Lake Sturgeon***Acipenser fulvescens*****Special Concern****Great Lakes and Western St. Lawrence River populations**

Assessment Criteria not applicable

Reason for Designation

A very large commercial fishery in the Great Lakes between the mid-1800s and early 1900s (i.e. 3-5 generations ago) reduced to a small fraction of their original size. Some of these populations are estimated to still be at very low levels. Populations are estimated to be declining in parts of the Ottawa River, and disappearing from many of its tributaries, due to dams. There has been a recent decline in the population in the St. Lawrence River likely due to overexploitation. Populations are currently impacted by the direct and indirect effects of dams, contaminants and invasive species. Poaching and genetic contamination through stocking and aquaculture programs might also hamper recovery. However, there are also a number of populations that are stable or showing modest increases and the species still occurs at many locations.

Range ON QC

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Great Lakes and Western St. Lawrence River populations" unit was designated Special Concern.

Lake Sturgeon***Acipenser fulvescens*****Special Concern****Rainy River-Lake of the Woods populations**

Assessment Criteria not applicable

Reason for Designation

Historically, populations in the designatable unit supported a substantial fishery, which led to a severe decline, however recovery has been sustained since 1970. For this population, dams have not impeded access to important stretches of sustainable habitat.

Range ON

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Rainy River-Lake of the Woods populations" unit was designated Special Concern.

Shortnose Sturgeon***Acipenser brevirostrum*****Special Concern**

Assessment Criteria Met criterion for Threatened, D2, but designated Special Concern because there are no immediate threats.

Reason for Designation

This is an anadromous species restricted to a single river system in Canada where spawning fish require unhindered access to freshwater spawning sites; but the population may have been divided since 1967 by the Mactaquac Dam. These large, slow growing, late maturing fish are conservation dependent. There is some risk to the species through mortality from hydroelectric facilities, by-catch in alewife and shad fisheries, and poaching. However, there is no immediate threat that would lead to elimination of the population in a very short period of time.

Range NB

Status History

Designated Special Concern in April 1980. Status re-examined and confirmed in May 2005.

Spotted Sucker***Minytrema melanops*****Special Concern**

Assessment Criteria not applicable

Reason for Designation

This freshwater fish species is restricted to southwestern Ontario. The greatest threat to this species is habitat degradation through increased erosion and turbidity. The species is also at risk in Pennsylvania but not at risk in Michigan (where it is S3-vulnerable), making rescue effect moderate at best.

Range ON

Status History

Designated Special Concern in April 1983. Status re-examined and confirmed in April 1994, November 2001 and May 2005.

Upper Great Lakes Kiyi***Coregonus kiyi kiyi*****Special Concern**

Assessment Criteria not applicable

Reason for Designation

Currently found only in Lake Superior, the subspecies has been extirpated from lakes Huron and Michigan, as the result of a complex of factors, which included exploitation and introduced exotic species. The extirpation in Lake Huron and Michigan occurred more than three generations in the past. The remaining population in Lake Superior appears to be stable, and supports a small, regulated fishery. Other threats, such as the introduction of exotic species, which impacted populations in the lower lakes do not appear to be important in Lake Superior.

Range ON

Status History

The Kiyi was designated Special Concern in April 1988. Split into two subspecies in May 2005 (Upper Great Lakes Kiyi and Lake Ontario Kiyi). The Upper Great Lakes Kiyi was designated Special Concern in May 2005.

Warmouth***Lepomis gulosus*****Special Concern**

Assessment Criteria Met criterion for Threatened, D2, but there is a possibility of a rescue effect from neighbouring populations in the United States. Therefore, designated Special Concern.

Reason for Designation

This species has a very restricted Canadian distribution, existing only at 4 locations along the Lake Erie shore between Point Pelee and Long Point. It is sensitive to habitat change which results in loss of aquatic vegetation.

Range ON

Status History

Designated Special Concern in April 1994. Status re-examined and confirmed in November 2001 and in May 2005.

Westslope Cutthroat Trout*Oncorhynchus clarkii lewisi***Special Concern****British Columbia population**Assessment Criteria not applicableReason for Designation

Populations are stressed by habitat loss and degradation resulting from agricultural and industrial activities as well as competition and hybridization with introduced species.

Range BCStatus History

Designated Special Concern in May 2005.

Winter Skate*Leucoraja ocellata***Special Concern****Georges Bank-Western Scotian Shelf-Bay of Fundy population**Assessment Criteria not applicableReason for Designation

The species possesses life history characteristics that increase vulnerability to exploitation, that reduce rate of recovery, and that increase the risk of extinction. These characteristics include delayed age at maturity, long generation time, low fecundity, and consequently slow population growth rate. The area of occupancy of this species has been stable in the Bay of Fundy and on Georges Bank. Estimates of population status on Georges Bank show no discernible trend over time. Abundance in the Bay of Fundy appears to have been stable over time. There is a high probability that the population receives immigrants from the species inhabiting the American portion of Georges Bank. The population is subjected to bycatch in fisheries for other groundfish shellfish species. There are directed fisheries for this species in U.S. waters.

Range Atlantic OceanStatus History

Species designated Special Concern in May 2005.

Lake Whitefish*Coregonus clupeaformis***Data Deficient****Lake Simcoe population**Assessment Criteria not applicableReason for Designation

Although this population is on its way to extirpation, there is inconclusive evidence regarding its distinctiveness and the best evidence available at this time is insufficient to resolve the species' eligibility for assessment.

Range ONStatus History

Designated Threatened in April 1987. Species considered in May 2005 and placed in the Data Deficient category.

Winter Skate*Leucoraja ocellata***Data Deficient****Northern Gulf-Newfoundland population**Assessment Criteria not applicableReason for Designation

The species exists in low concentrations in the Northern Gulf of St. Lawrence, in the coastal waters off the southern coast of Newfoundland, and on the southern portion of the Grand Bank. A quantitative analysis of spatial and temporal variation in population size is not possible because of the infrequency with which the species is caught. The population is subjected to bycatch.

Range Atlantic OceanStatus History

Species considered in May 2005 and placed in the Data Deficient category.

Arthropods**Ottoe Skipper***Hesperia ottoe***Endangered**

Assessment Criteria B1ab(iii)+2ab(iii)

Reason for Designation

This species has been found at very few locations in the Canadian prairies where it is associated with fragmented and declining mixed-grass prairie vegetation. It has recently been found at only one location.

Range MB

Status History

Designated Endangered in May 2005.

White Flower Moth

Schinia bimatrix

Endangered

Assessment Criteria B1ab(iii)c(iv)+2ab(iii)c(iv)

Reason for Designation

This moth is associated with dune habitats and is known from a small number of scattered sites in North America, with only one extant site in Canada. Most dune habitats in Canada appear to be too dry for this species. Dune habitat has undergone serious declines and the moth has likely declined as well.

Range MB

Status History

Designated Endangered in May 2005.

Verna's Flower Moth

Schinia verna

Threatened

Assessment Criteria B2ab(iii)

Reason for Designation

This moth is found only in the Canadian prairies, with one extant site in southeastern Alberta. The species is known historically from very few locations despite its relatively large size, distinctive markings and day-flying habit. It has a small total range in suitable native prairie that is fragmented and declining in quality and extent.

Range AB SK MB

Status History

Designated Threatened in May 2005.

Dark-banded Flower Gem

Melaporphyria immortua

Data Deficient

Assessment Criteria not applicable

Reason for Designation

There are very few and widely scattered records of this moth in North America, and it was most recently found in Canada in 1979. It is suspected of being extirpated from the eastern part of its range. In Canada it has been found in native prairies, a habitat that has been greatly reduced. However, detailed habitat requirements and food plants are not known which makes surveying for this species difficult. Information gaps need to be addressed before a status can be assigned.

Range AB SK MB

Status History

Species considered in May 2005 and placed in the Data Deficient category.

Vascular Plants

Branched Phacelia *Phacelia ramosissima* **Endangered**
Assessment Criteria B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v)

Reason for Designation

A geographically highly restricted perennial known only from three small populations numbering fewer than 1,000 plants subject to continued habitat loss and population decline from urban expansion and mining activities.

Range BC

Status History

Designated Endangered in May 2005.

Dense Spike-primrose *Epilobium densiflorum* **Endangered**
Assessment Criteria A3c; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Reason for Designation

An annual herb of a restricted habitat type within the Garry Oak Ecosystem that has undergone significant declines in number of populations and is subject to continued habitat reduction due to development and the spread of exotic weeds. The four extant populations are fragmented, small, and have little chance of being repopulated from adjacent sites in Washington State should they become extirpated.

Range BC

Status History

Designated Endangered in May 2005.

Dense-flowered Lupine *Lupinus densiflorus* **Endangered**
Assessment Criteria B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v); C1

Reason for Designation

An annual with a highly restricted distribution known from three Canadian locations. The total population size is small and fluctuates considerably depending on climatic conditions. These populations are subject to continued risks from habitat loss and degradation due to activities such as urban development, trampling, mowing and competition with invasive exotic plants.

Range BC

Status History

Designated Endangered in May 2005.

Grand Coulee Owl-clover *Orthocarpus barbatus* **Endangered**
Assessment Criteria B1ab(ii,iii,iv,v)c(iv)+2ab(ii,iii,iv,v)c(iv)

Reason for Designation

A semiparasitic annual restricted to a small area east of the Cascade Mountains. The few small populations are subject to extreme fluctuations in numbers of mature plants and at continued risk from introduced weeds, overgrazing and housing developments. One population in South Okanagan Grasslands Protected Area is protected from development.

Range BC

Status History

Designated Endangered in May 2005.

- Spalding's Campion** *Silene spaldingii* **Endangered**
Assessment Criteria B1ab(iii)+2ab(iii); C2a(i,ii); D1
Reason for Designation
 This long-lived perennial herb is a globally imperiled species restricted to two small areas west of the Rockies with only a single population in southern British Columbia. The Canadian population is one of the largest populations known but may contain fewer than 250 mature plants. These plants are at risk from on-going habitat loss and degradation especially by introduced weeds.
Range BC
Status History
 Designated Endangered in May 2005.
- White Meconella** *Meconella oregana* **Endangered**
Assessment Criteria A3c; B1ab(i,ii,iii,iv,v)c(iv)+2ab(i,ii,iii,iv,v)c(iv); C1+2b
Reason for Designation
 A globally threatened annual plant with a highly restricted Canadian range and area of occupancy present at only five locations within the naturally rare Garry Oak Ecosystem. Its populations, totalling fewer than 3,500 mature plants, fluctuate greatly with varying precipitation patterns and are at imminent risk of major losses from development within the highly urbanized range of the species. Its habitat has also been impacted by the spread of many exotic weedy plants.
Range BC
Status History
 Designated Endangered in May 2005.
- Baikal Sedge** *Carex sabulosa* **Threatened**
Assessment Criteria Met criterion for Endangered B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v), but designated Threatened because there are large numbers in protected areas and because of the low level of threats within these localities. Criteria met for Threatened B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v); D2.
Reason for Designation
 A geographically restricted species of three sand dune areas that serve as habitat for five populations. These consist of several million shoots produced mainly through asexual reproduction. The species has been impacted by declines in population numbers, size, area, quality of its habitat and on-going impacts from the recreational use of all-terrain vehicles; at Carcross and Bennett Lake. Such activity and much increased tourist visitations at the Carcross dune systems may result in increased impacts on the habitat with the development of a major resort facility at this location by 2006. If the Alsek River is dammed again by the advance of the Lowell Glacier, as has occurred in recent past, the large population at the confluence of the Dezadeash and Kaskawulsh Rivers could be at risk.
Range YT
Status History
 Designated Threatened in May 2005.
- Cliff Paintbrush** *Castilleja rupicola* **Threatened**
Assessment Criteria Met criteria for Endangered, D1, but designated Threatened, D1+2, because it is distributed over several mountain ridges and thus is not at imminent risk of extirpation.
Reason for Designation
 A perennial of restricted geographical occurrence found on cliffs, rock outcrops and ridges at high elevations. The small, fragmented, populations consist of scattered individuals, likely fewer than 250 plants, which are exceptionally vulnerable to stochastic events.
Range BC
Status History
 Designated Threatened in May 2005.

False Rue-anemone***Enemion biternatum*****Threatened**

Assessment Criteria Met criteria for Endangered, B1ab(iii)+2ab(iii), but designated Threatened because the populations appear stable and not at imminent risk of extirpation. Criteria met for Threatened: B1ab(iii)+2ab(iii); D2.

Reason for Designation

A delicate, spring-flowering, perennial herb restricted to a few fragmented riverside forest sites in southwestern Ontario where its populations are at risk from habitat loss and decline in quality due to a variety of activities including recreational trail use, and expansion of exotic invasive plants.

Range ON

Status History

Designated Special Concern in April 1990. Status re-examined and designated Threatened in May 2005.

Mountain Holly Fern***Polystichum scopulinum*****Threatened**

Assessment Criteria Met criteria for Endangered, B1ab(iii,v)+2ab(iii,v), but designated Threatened because of the uncertainty about the imminent threats from mining activities at the British Columbia sites. The species is also protected in Quebec. Criteria met for Threatened: B1ab(iii,v)+2ab(iii,v); C2a(i); D1+2.

Reason for Designation

A fern of very restricted occurrence on serpentine substrates in three widely separated areas of Canada. These very small populations are at risk from stochastic events and, the 3 in British Columbia, from potential mining activities for precious metals.

Range BC QC NL

Status History

Designated Threatened in May 2005.

Hill's Pondweed***Potamogeton hillii*****Special Concern**

Assessment Criteria not applicable

Reason for Designation

An inconspicuous, rooted, aquatic plant currently known from fewer than 20 Canadian populations and occupying a very small total area of habitat. No imminent limiting factors have been identified that would have significant impacts on this globally rare species, but invasive exotic plants may be impacting some populations.

Range ON

Status History

Designated Special Concern in April 1986. Status re-examined and confirmed in May 2005.

Houghton's Goldenrod***Solidago houghtonii*****Special Concern**

Assessment Criteria Met criterion for Threatened, D2, but designated Special Concern because many of the plants are in inaccessible areas and in a provincial nature reserve.

Reason for Designation

A Great Lakes endemic present in Ontario at the tip of Bruce Peninsula and on Manitoulin Island. The few populations occupy very small areas of provincially rare alvar habitat that are at potential risk from aggregate extraction, use of recreational vehicles and expansion of invasive weeds.

Range ON

Status History

Designated Special Concern in May 2005.

Prototype Quillwort***Isoetes prototypus*****Special Concern**

Assessment Criteria not applicable

Reason for Designation

A regional endemic with almost all of its global population in Canada. The species is an aquatic perennial with very specific habitat requirements limiting its occurrence in Canada to about 12 small, unconnected lakes in Nova Scotia and New Brunswick. The species is found in nutrient-poor, cold, spring-fed lakes. Although several sites have been shown to contain large numbers of plants, one half of the documented sites contain small populations. A wide range of potential limiting factors could impact the species, including changes in water quality, boating and shoreline development.

Range NB NS

Status History

Designated Special Concern in May 2005.

Mosses**Banded Cord-moss*****Entosthodon fascicularis*****Special Concern**

Assessment Criteria not applicable

Reason for Designation

This rare species is endemic to western North America. Almost all Canadian populations of this moss occur in the threatened Garry Oak habitat of southwestern British Columbia. Should habitat destruction continue at the present rate, the species will become increasingly vulnerable.

Range BC

Status History

Designated Special Concern in May 2005.

Pygmy Pocket Moss***Fissidens exilis*****Special Concern**

Assessment Criteria not applicable

Reason for Designation

A moss with a limited distribution in eastern North America, but which is widespread in Europe. Few populations have been documented in Canada, primarily in Ontario where it occurs in heavily populated and developed areas where natural habitats are widely known to be at serious risk. Although cryptic in habit, the species often grows with other small species that have well documented ranges. The species prefers woodlands, where it is usually found on bare clay or disturbed soil. Most locations are in areas benefiting from some level of conservation protection.

Range ON QC

Status History

Designated Special Concern in May 2005.

Schleicher's Silk Moss***Entodon schleicheri*****Data Deficient**

Assessment Criteria not applicable

Reason for Designation

This is a robust creeping moss of mature riparian mixed wood forest. It is known from 10 localities from Canada in the Northwest Territories, British Columbia and Alberta. At four of these 10 localities, populations have declined or are expected to decline in the future. Threats are urban development and recreational traffic and resource development (logging, oil and gas development). However, riparian habitats cover large areas of western Canada and no targeted searches have been conducted for this species. Hence reliable population estimates for this moss are lacking.

Range NT BC AB

Status History

Species considered in May 2005 and placed in the Data Deficient category.

Lichens

Frosted Glass-whiskers

Sclerophora peronella

Special Concern

Nova Scotia population

Assessment Criteria not applicable

Reason for Designation

This tiny cryptic stubble lichen is very rare or threatened over much of its global range. Two of the three known locations of this species in Canada are in Nova Scotia. Despite considerable efforts to locate this and other rare calicioid lichens in the province, this lichen is known only from the exposed heartwood of red maple trees in mature/old growth hardwood forest. Threats include potential habitat loss and degradation associated with the decline of old growth forest ecosystems. However, in Nova Scotia each of the two populations appear healthy and are situated within large protected areas on Cape Breton Island.

Range NS

Status History

Designated Special Concern in May 2005.

Frosted Glass-whiskers

Sclerophora peronella

Data Deficient

British Columbia population

Assessment Criteria not applicable

Reason for Designation

This tiny cryptic stubble lichen is very rare or threatened over much of its global range. The species is known from only one site in the north-central part of the province where it was found once on a large cottonwood. Although search effort for stubble lichens has been extensive in regions farther south within the province, search effort in the northern region where the species was found was inadequate.

Range BC

Status History

Species considered in May 2005 and placed in the Data Deficient category.

Withdrawn reports

The report on the Umatilla Dace (*Rhinichthys Umatilla*) was withdrawn in May 2005 to incorporate additional information, and will be brought back within two years.

The Report on the Nugget Moss (*Microbryum vlassovii*) was withdrawn for incorporation of additional information on search effort.

Deferred reports

Even if COSEWIC has assessed in May 2005 the Lake Sturgeon (*Acipenser fulvescens*) and the Westslope Cutthroat Trout (*Oncorhynchus clarkia lewisi*), the status reports for these species will only be finalised in 2006 and will be included with the 2006 COSEWIC Annual Report. For this reason, COSEWIC is not submitting those status assessments for consideration for listing under SARA at this time.

CANADIAN SPECIES AT RISK

August 2005



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IN CANADA



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